

FARM WORKSHOP Guide



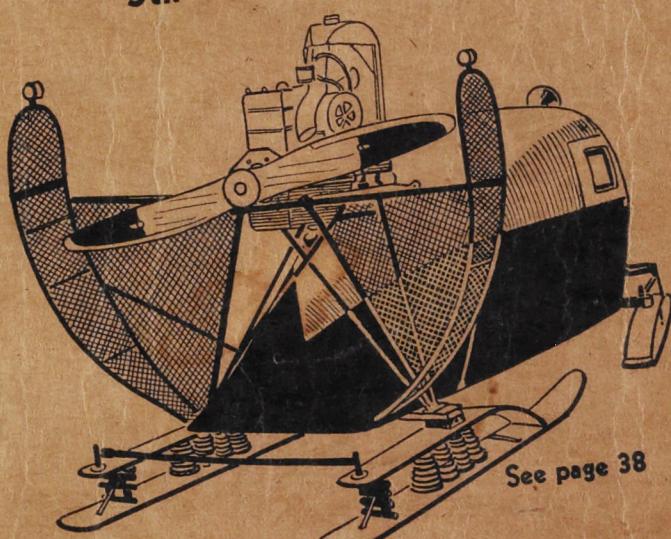
Marvin C. Colenutt

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Illustrates and Describes a Multitude of Devices for the Farm and Home that may be Constructed in the Farm Workshop

EDITED BY
R. D. COLQUETTE
5th Edition



See page 38
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THE *Country* GUIDE
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Write
for
FREE
BOOKLET
To-day!

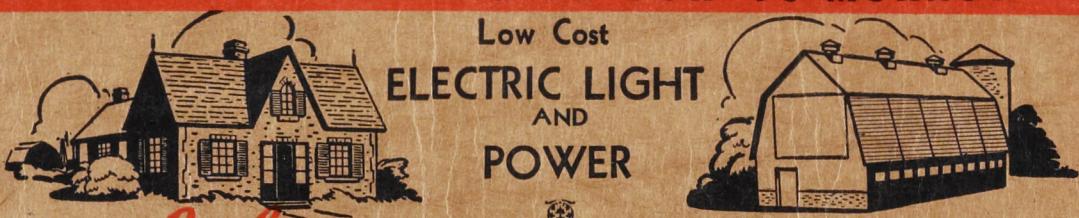
Save for Victory....TO-DAY
Plan for Johnson Products...TO-MORROW

NOT until the last bomber is grounded will Johnson Precision-built Products again be available to bring you the comforts and conveniences you now so greatly desire. TO-DAY, Victory calls for "all-out" sacrifice, with a supreme "total-war" effort. However, TO-DAY you may plan for TO-MORROW, and with War Saving Stamps and Certificates make possible the fulfilment of your desire. For your farm home you may plan for up-to-date modern Johnson ELECTRIC LIGHT and POWER, provided at low cost and most satisfactorily with the Chore-Horse—Iron-Horse equipment. TO-MORROW, no doubt; you will want this equipment without delay, so write now for complete information and descriptive booklet on these dependable, economical power plants, their varied uses and just how the earliest possible delivery may be secured for you TO-MORROW.

SAVE FOR TO-MORROW

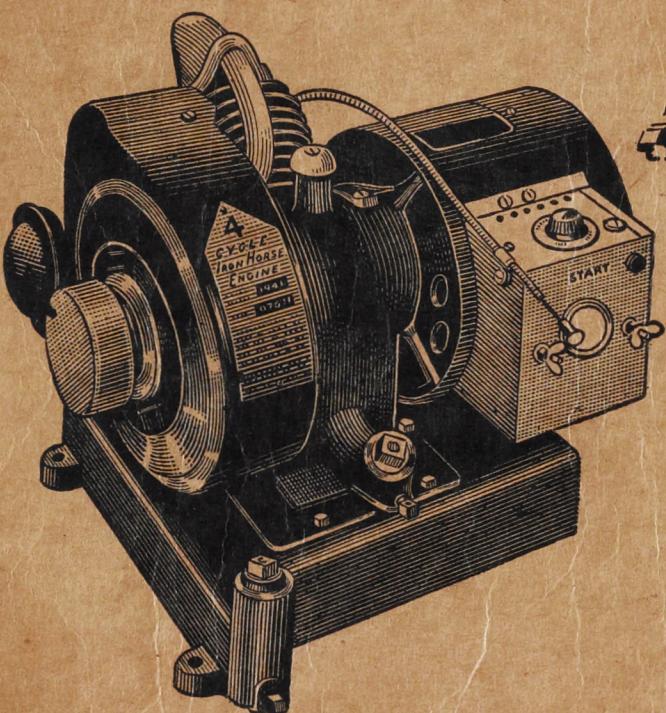
Low Cost

**ELECTRIC LIGHT
AND
POWER**



Johnson **Chore - Horse** **Generators**

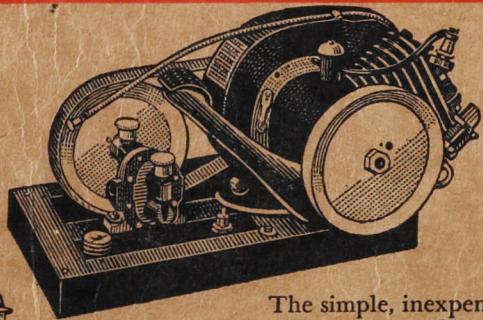
Comforts, labour-saving and money-making conveniences from Johnson Electric Light in house, barn and yard may be yours, and obsolete, hazardous lamps and lanterns replaced. Hours of labour and time saved will soon pay for this low cost equipment. Easy to install—Low cost to operate—Years of satisfaction. Schedule your chores regardless of darkness.



Abundance of light for all purposes. Increased comforts and relaxation. Dangerous fire hazards removed.

SAVE FOR TO-MORROW

Dependable - Economical - Powerful



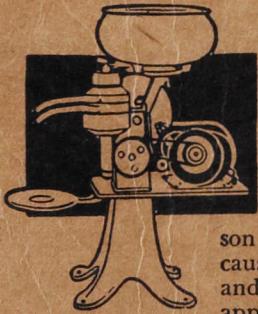
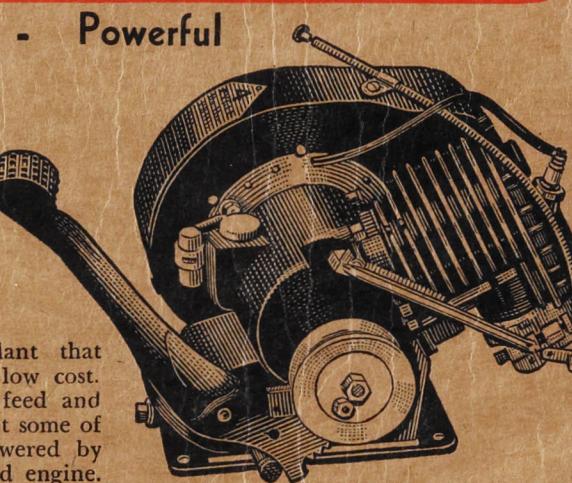
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Pump



The simple, inexpensive Johnson Water Pump solves the problem of running water for house, barn and pasture. No longer need you pump and carry water.... Attach this simple unit to your Iron-Horse Engine (as shown), and hours of time and strenuous labour will be saved.

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of Satisfaction**

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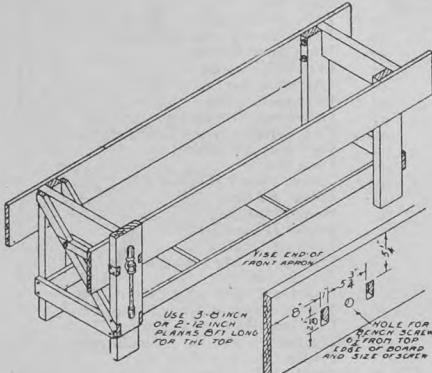
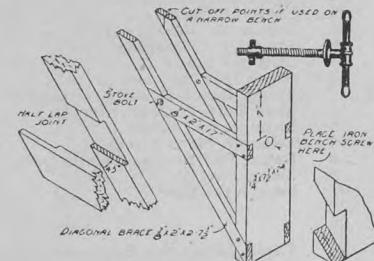
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Work Bench and Machine Shop

Workbench and Wood Vise

WITH these drawings before him the farmer will have no difficulty in framing a workbench with a wood vise attached. The idea followed in con-

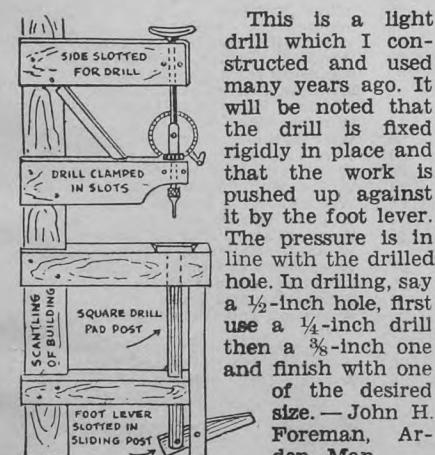


structing the wood vise is to have the outer jaw always perpendicular when gripping the work. The frame arrangement slides along under the bench top to accomplish this object. The iron screw normally is available in any good hardware store.

A Bench Drill

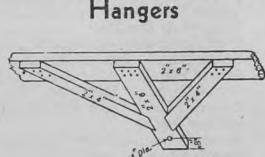
This is a drill which I found very easy to construct. A casting from a plow coulter (A) is bolted to a 4x4 and held rigid by means of two steel braces. A shaft the size of the hole in the casting is drilled and keyed to a wheel. A clamp is fitted on below the casting, a small hole having been drilled in the shafting to afford a better grip for the set screw. A hole is drilled in the end of the shaft and another one into it from the side. Another clamp is then fitted to the shaft and a set screw fitted into this second hole holds the drill or bit in place. The 4x4 slides up and down, being held to the wall by the bench (B) and a steel strap iron (C) bolted to the wall. Pressure is obtained by putting weights on the steel bracket (D). —W. J. Loreburn, Sask.

Converted Breast Drill



This is a light drill which I constructed and used many years ago. It will be noted that the drill is fixed rigidly in place and that the work is pushed up against it by the foot lever. The pressure is in line with the drilled hole. In drilling, say a $\frac{1}{2}$ -inch hole, first use a $\frac{1}{4}$ -inch drill then a $\frac{3}{8}$ -inch one and finish with one of the desired size. —John H. Foreman, Arden, Man.

Post Hangers and Drop Hangers

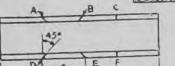
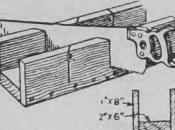


In putting a line shaft in the workshop you may need one or both of these two types of hangers. On the left is a drop hanger, which is fastened to an overhead joist. The main pieces are 2x6, while the braces are of 2x4 and are let in to the main piece. The hole is the size of the shaft and is three inches from the end.

The post hanger is attached, like a bracket, to a stud. Two pieces of 1x4 will do with the hole bored through them where they lap.

Miter Box is Easy to Make

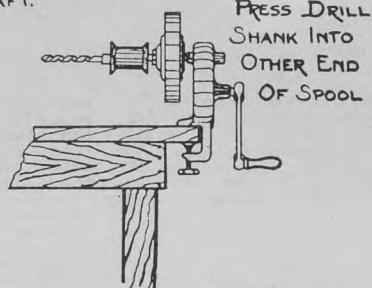
On jobs of sawing small-sized lumber, molding, etc., where diagonal ends are desired, the best and quickest way to make accurate cuts is with a miter box. The figure shows a simple box that you can make in a short time, from a piece of 1x8 inch lumber 5 feet long cut in the centre to form the sides and a piece of 2x6 inch lumber 30 inches long to form the base. Assemble the box with wood screws, measure for cuts as shown and follow the marks carefully when sawing.



High Speed Drill

This shows how to convert an ordinary hand grinder into a high speed wood drill by using a common thread

SCREW SPOOL ON END OF GRINDER SHAFT.



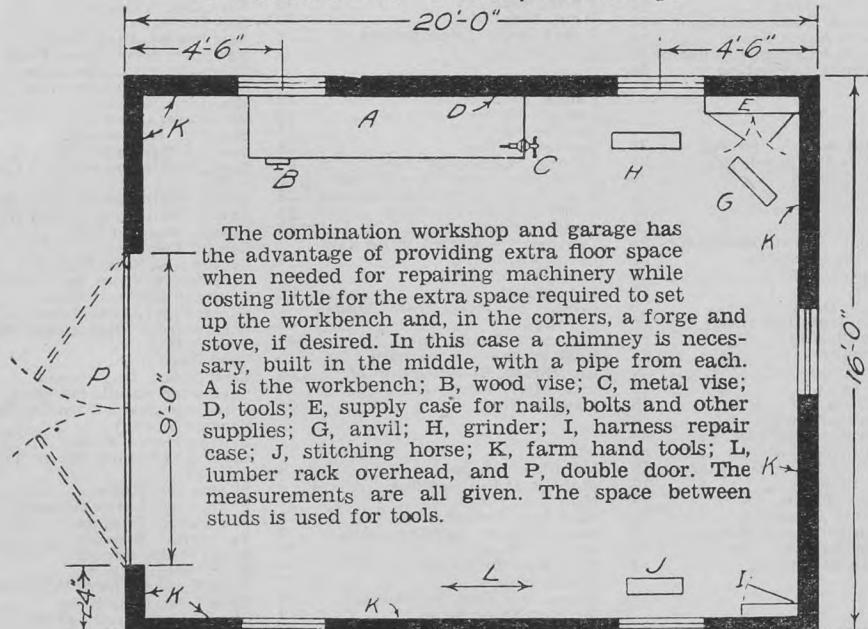
spool. Square one end of the spool hole by pressing the bit shank into it a short distance. Turn the opposite end on to the protruding threaded grinder shaft. This is especially useful to model makers and shops without electric power. While it would not be suitable for heavy work, it does give the high speed necessary for fine, smooth, accurate jobs.

Farm Workshop Guide

The Farm Workshop Guide preserves in a more permanent form material that has appeared in the mechanical departments of The Country Guide. Most of the ideas it contains were sent in by Country Guide readers. They have been supplemented, however, with information prepared by professional agricultural engineers. It was planned to make this, the fifth edition, a book of 70 pages or more, but wartime restrictions on paper consumption, just as we went to press, compelled us to keep it down to the size of the previous issue. For this reason some items that would otherwise have been included have had to be omitted. Acknowledgment is made to advertisers whose patronage has made it possible to keep down the price of the book and whose reliability is vouched for.

R. D. Colquette.

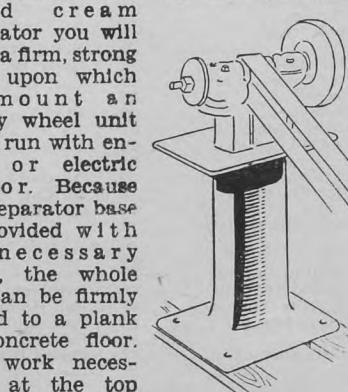
Combination Farm Workshop and Garage



The combination workshop and garage has the advantage of providing extra floor space when needed for repairing machinery while costing little for the extra space required to set up the workbench and, in the corners, a forge and stove, if desired. In this case a chimney is necessary, built in the middle, with a pipe from each. A is the workshop; B, wood vise; C, metal vise; D, tools; E, supply case for nails, bolts and other supplies; F, anvil; G, grinder; H, harness repair case; I, stitching horse; K, farm hand tools; L, lumber rack overhead, and P, double door. The K measurements are all given. The space between studs is used for tools.

Cream Separator Base Supports Emery

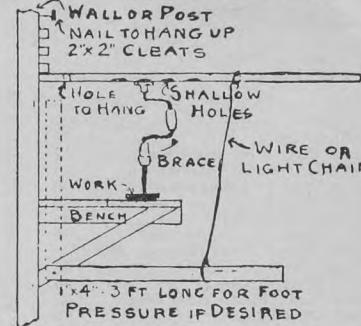
By removing the top unit of a discarded cream separator you will have a firm, strong base upon which to mount an emery wheel unit to be run with engine or electric motor. Because the separator base is provided with the necessary holes, the whole job can be firmly bolted to a plank or concrete floor. The work necessary at the top will depend upon the shape and size of the emery wheel



unit, but this usually will require no more than the cutting of a square two inch thick base of hardwood, bolting this to the top of the separator frame and then bolting the emery unit to the top of this. —Dale Van Horn.

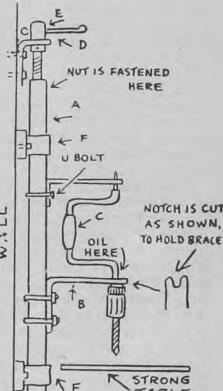
Handy Shop Drill

An ordinary hand brace can be made to save a lot of labor in drilling holes in iron as shown. The easiest way to make the shallow holes to hold the round brace head is to burn them with a red-hot iron door knob or large pipe cap. A good sized clamp is desirable to hold metal pieces for drilling. —I.W.D.



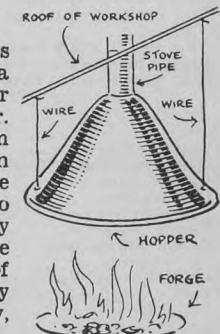
Cheap Press Drill

All this press drill cost me was a thorough search of the junk pile and some careful work. The parts required are: A 3-foot length of 1 $\frac{1}{2}$ -inch pipe (A); a brace with the head removed (C); two pieces of heavy steel (B and D), which can be cut from the corners of an old plow frame; a screw and nut (E) with a sliding handle; and two guides (FF) to hold the pipe and allow it to slide up and down freely. The unit is bolted to a stout stud. The steel bar (D) must be made very secure. —Frank Neufeld, Holmfeld, Man.



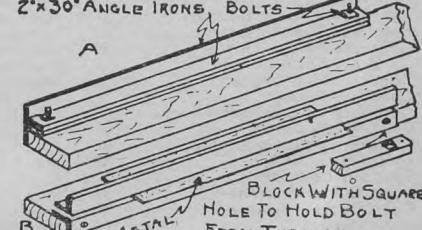
Forge Hood

I made this forge hood from a discarded hopper off a grain grinder. It is hung from the rafters with wire and a stove pipe is fitted into it. It serves very nicely to take away the smoke of the forge. —Sidney Thompson, Bently, Alta.



Handy Sheet Metal Bender

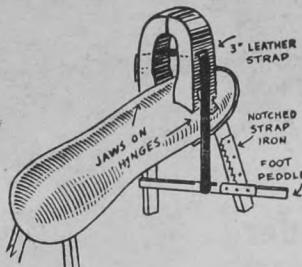
This handy sheet metal clamp will be found very convenient for making square bends in sheet metal for use on self feeders, roofing, gutters, etc. It is simply one two-inch angle iron, three to four feet long fastened on the edge of a somewhat longer 2x8 by heavy flat headed screws placed both in the top and edge of the board. A second two-inch angle operates on the first one by using two 1 $\frac{1}{2}$ x 3 $\frac{1}{2}$ inch machine bolts with the heads below the board and covered with hardwood blocks with 2' x 30° angle iron bolts.



square depressions to keep the bolts from turning. The metal is placed as at B projecting to the line of the desired bend, and the nuts drawn down tight. The bend can then be easily made with the hammer or mallet. —I.W.D.

Sewing Horse

This sewing horse will hold anything from a thin strap to a horse collar and it comes in very handy when getting the harness ready for work. The jaws are fastened on the block with hinges for a wide opening. A 3-inch strap is



fastened to one jaw and passed through the other and down to the foot pedal which pulls the jaws together when pressed down. A notched piece of iron is fastened to the leg to hold the pedal. The diagram shows the seat made of a piece of log but it can also be made from a piece of good planking.

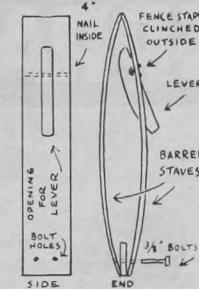
Stitching Clamp for Harness

A stitching clamp for the repair of harness can be made from two barrel staves. When using the clamp hold it between the knees and your shoes. You will find that it is worth while to make such a holder even for a few jobs in harness sewing.—W. Kalbfleisch.



Stitching Horse

This handy stitching device is made from two barrel staves. The two $\frac{3}{8}$ -inch bolts at the bottom should be tightened until the staves fit tight on the $1\frac{1}{4}$ between, giving pressure on the jaws. In one stave there is a slot into which a lever is hinged. A 4-inch nail is fastened on with staples, forming a pivot. The lever spreads the jaws for inserting the work.



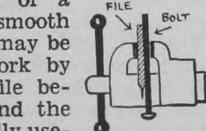
Saw Vise

A simple but efficient saw vise can be made from the bridges of an old stove. Drill a hole a little above the centre in both sections. Fasten one to the post with a screw nail through the top hole, first inserting a bolt, the head of which is recessed in the post. Now put the second section on the bolt and fasten with a wing nut. Then fasten the two pieces to the post at the bottom with a long screw with a washer between. This brings the tops together tightly on the saw when the vise is tightened.—R. C. Willett, Cochin, Sask.



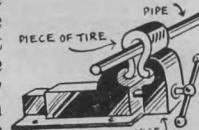
For Smooth Jaw Vise

When the jaws of a vise become worn smooth a substantial hold may be secured on the work by inserting an old file between the work and the jaw. This is especially useful when burring the end of a hard bolt.—John A. Paterson, Kinistino, Sask.



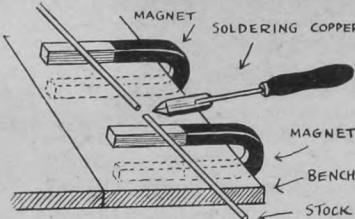
Clamp for Thin-Wall Pipes

A clamp to be used with a vice for holding sheet metal pipes can be easily made by cutting a section out of an old tire and gripping it in the vise as shown. It will hold the delicate pipe without bending it out of shape.—A. F., B.C.



A Handy Soldering Vise

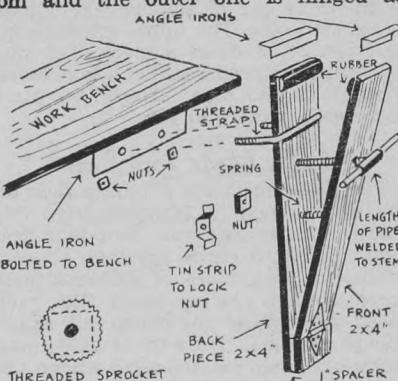
A pair of magnets will serve as a handy vise for holding small articles for



soldering. They will hold the articles to be soldered without absorbing the heat as is the case when using a heavy vise. They also prevent burning the work-bench when soldering is done directly on the wood. They will hold only steel or iron.—A. S. Wurz, jr., Rockyford, Alberta.

Vise from Auto Jack

A vise for holding boards while planing and for general woodwork can be improvised from pieces of lumber and an old screw type auto jack. The jaws have a spacer between them at the bottom and the outer one is hinged as



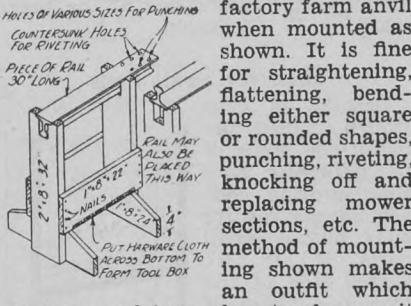
shown. The screw is received at the back by the sprocket, which has been squared to form a nut and is kept from turning by passing a piece of strap iron and nailing it down at both sides. A coiled spring pushes the jaws open. For fine work the strips of old rubber tire can be put on the jaws or short pieces of angle iron can be slipped over the ends when metal objects are being held. A short piece of pipe is welded to the stem to receive the handle.—John J. Froese, Altona, Man.

Convenient Home-made Anvil

A short piece of railroad or street car rail, which can be bought very cheaply from section foremen or junk dealers,

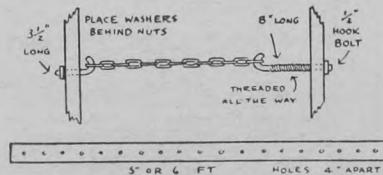
makes a very satisfactory farm anvil when mounted as shown. It is fine for straightening, flattening, bending either square or rounded shapes, punching, riveting, knocking off and replacing mower sections, etc. The method of mounting shown makes an outfit which

can be moved from place to place, or it can be mounted on a concrete base if preferred. The framework will be very much more rigid if the joints are brushed with waterproof glue before being put together.



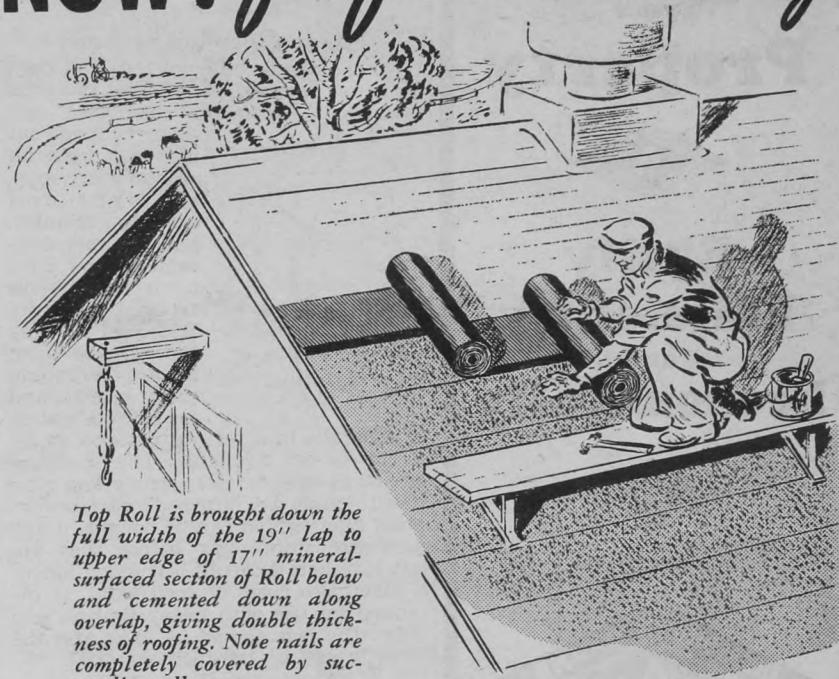
Clamp For Carpenter Work

For this clamp use two pieces of 2×4 about five or six feet long. Bore holes four inches apart the full length of both pieces. Make four bolt hooks of half-inch iron, two of which are made just long enough to fasten through the holes in one bar, the other about eight



inches long and threaded most of their length. To connect the bars use six-foot trace chains, which can easily be adjusted to the depth of the work; but any kind can be used, even pieces of wire. Use washers under the nuts. Hardwood bars are best if you have them.

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Shear Cuts for Rivets

The best way for cutting off rivets is to shear them off with a square end chisel, rather than cut them with a sharp edge. This is the method used by most wreckers in tearing up car frames.



Handy Open-top Sawhorse

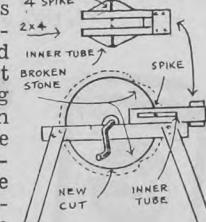
No one can do efficient repair or construction work without at least two good sawhorses. Open-top sawhorses can easily be made out of scrap material around every shop, are light and easily handled, and are very convenient for the many repair jobs around the farm. The chief advantages of the open top are for ripping short boards and for holding a stick or a handle in a vertical position where a vise is not available. The sawhorse will be at least twice as strong and rigid if all joints are brushed with waterproof glue (which can be bought in any hardware store) just before they are put together; and will last much longer if given two coats of good paint. If intended for use with heavy timbers and poles, the legs should be 2x4's and the cross braces of 1x8-inch material.

Chain Link Tool

This tool is for taking links out of a drive chain. It is 15 inches long, from a piece of steel 1 1/4-inch thick. The end is flattened down to 1/2-inch in thickness and the slot is 5/16-inch by 2 inches. This will take any link from the flat style of bull chain or the feeder chain of a thresher to the small kind used on a fanning mill. The notch is slid on to the link and the link is then turned to the proper position to come apart. Then strike the free link with a hammer and the chain is apart.—Geo. Z. Merkley, Springwater, Sask.

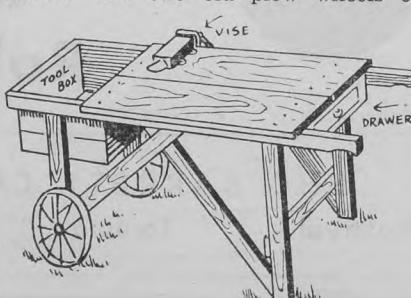
Re-shaping Grindstone

If the grindstone has worn out of shape or has a piece broken out of it, take two pieces of 2x4 about 18 inches long, nail them together at one end with a piece of soft lumber leaving clearance enough for the grindstone to turn freely between them. Bore two small holes exactly opposite each other through the 2x4's as shown in the sketch so that they will be inside the broken part of the stone. The holes should be just large enough so that a 4-inch spike will pass through them freely. Then nail or wire the device on the frame with a 2x4 on each side of the stone. Put a 4-inch spike in each hole and over them tack pieces of inner tubing to give pressure. Start turning the grindstone without using water and soon the nails will shear off the stone to a true circle.—Daniel Harris, Edgeworth, Sask.



Portable Workbench

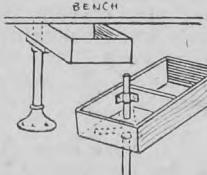
On the farm there is a lot of repair work that cannot be taken indoors to the workbench. The sketch shows a simple way of taking the workbench to the job. This portable workbench is sturdily constructed of old pieces of lumber and two old plow wheels or



other similar wheels that may be available. A box is built into one end to hold the necessary tools while a drawer to hold bolts, nails, screws, etc., may be placed at the other end if desired. The side rails extend at the end opposite the wheels to serve as handles when the bench is being moved. The whole structure should be rigidly built and the wheels must fit tightly to secure a firm surface.—J.A.S.

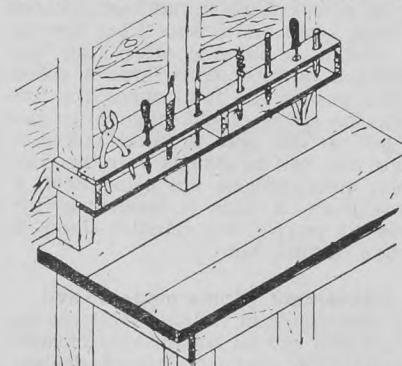
Swinging Bench Drawer

This style of a bench drawer, first published in a mechanics magazine, has many advantages. It can be swung completely out where the contents can be gotten at without difficulty and it is not in danger of dropping, as a drawer is when it is pulled too far out. The support of the bench is part of an old axle housing. The hole in the bottom of the drawer must fit the support snugly and should be reinforced by an extra ply of lumber screwed on along with glue. The upper drawer support can be made of a piece of 2-inch stuff with the proper size of a hole bored through it and also fastened in place with screw nails and glue.



Easily Made Tool Rack

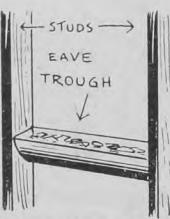
The diagram shows a handy rack on the work bench. It is made from two boards four inches wide and four feet long, nailed to three 1x2-inch spacers as shown, with holes of different sizes bored through the top board. This rack keeps the tools off the bench and available at all times. Drawers to hold small materials could be arranged under the lower board, or better still they could be put into small screw top glass jars



with the caps fastened with nails or screws to the under side of the lower board.—I. W. Dickerson.

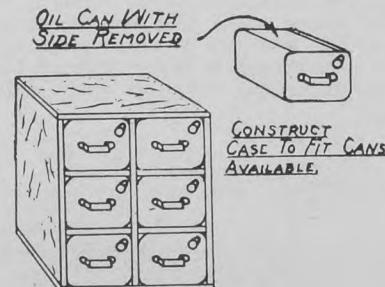
Shelf for Small Parts

Lengths of eave trough, nailed between the studs of the garage or work shop provide convenient shelves for bolts, nuts or small parts. With the curved side of the trough outward it is easy to pick out the parts wanted.—Edwin Unger, Mayfair, Sask.

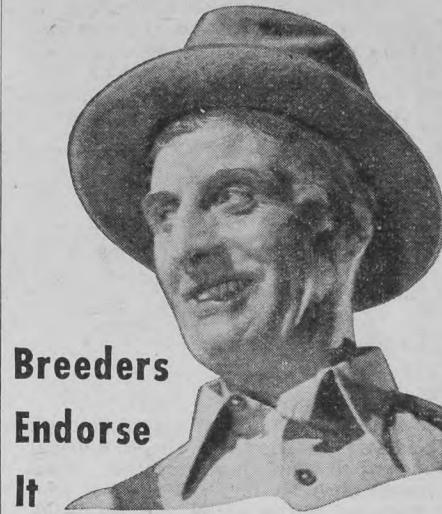


Empty Oil Can Cabinet

The diagram shows how to make a convenient cabinet out of empty oil cans for storing nails, screws, bolts, and other small articles about the shop and



household. The top side is cut out and the cut edges turned in and hammered down flat to avoid danger of cutting the hands. The handles on the can are used for pulls.



Breeders Endorse It

Breeders and other cattle men who wish to free their herds from the disadvantages and annoyances of "fly irritation" use Shell Livestock Spray. They've found it kills flies quicker—repels longer after each spraying. Decidedly effective—yet will not burn, irritate or stain animals.

SHELL LIVESTOCK SPRAY



DO IT WITH A VICTOR

For odd jobs around the place, where a good, clean sawing job is wanted in a hurry, use a VICTOR high-speed steel Unbreakable Special Flexible Hack Saw Blade, properly set in an improved VICTOR Frame. This combination is ideal for making emergency repairs to farm equipment. The VICTOR high-speed blade was developed especially for cutting tough metals, and the flexible back makes it handy for sawing in inconvenient places. The VICTOR high-speed steel "MOLY" Type* Blade is recommended for cutting hard materials.

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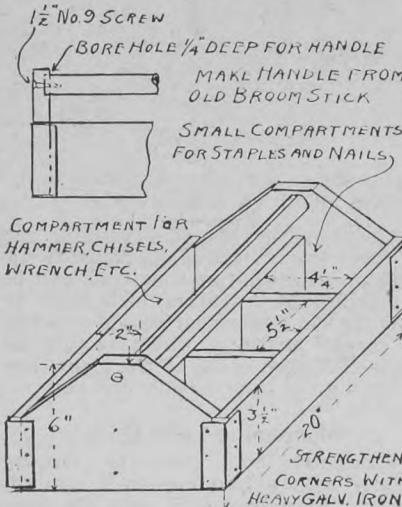
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Hand Box for Tools

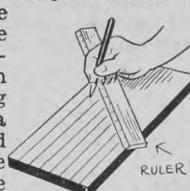
In the old days carpenters used a hand basket for carrying the tools they needed on the job. A box is handier and can be made from stuff picked up around the place. The sides are best of thin material. For carpenters' tools it



is best made long enough to take a saw though this is not absolutely necessary. The box shown is 20 inches over all, and has corners reinforced with sheet iron. The sides are 3 1/2 inches deep and the ends at the highest point six inches. The width is about 10 inches. One side is divided into compartments for nails and staples.—I.W.D.

Board Divided Into Equal Spaces

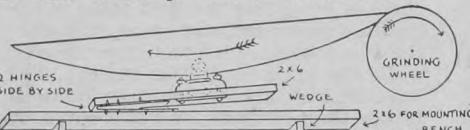
Suppose you have a board five and one-half inches wide that you want to rip into eight strips of equal width. Of course, you can figure out the width of the strips mathematically, but there's a much easier way of doing the job. Just lay a ruler across the board at an angle, with the figure eight at one edge and the figure one at the other. The inch marks automatically divide the space into eight equal parts. Better keep this dividing trick in mind as you'll be sure to need it sooner or later in your shop work.



Sharpening Tiller Discs

This is how I built a very satisfactory device for sharpening my tiller discs. Do not place the pivot (disc bearing) directly behind the emery wheel, but about two inches toward the most convenient side. For mounting use a 2x6 or 2x8 and on this use a piece of 2x6 which is fastened to the mount by two hinges placed side by side. To this 2x6 an old ball race is securely fastened, and by means of a nut or collar to centre the disc, a concave washer and a tightener bolt and nut, the whole assembly is put together so that the weight falls on the grinder. This pressure may be regulated by moving the disc pivot closer to or farther from the hinges. I find that about six inches from the back of the hinges to the pivot about right for a 22-inch disc.

Put on the disc and tilt by means of the wedges until the edge lies flat on the centre of the grinder, and adjust until about half an inch is brightened when the disc is sharp. The grinding wheel



will keep the disc revolving and there is no danger of it becoming over heated. The hinges allow an even pressure all around. When the edge of the disc is ground down to about the thickness of the back of a thin table knife take disc off pivot, turn it over and finish from the inside by hand.

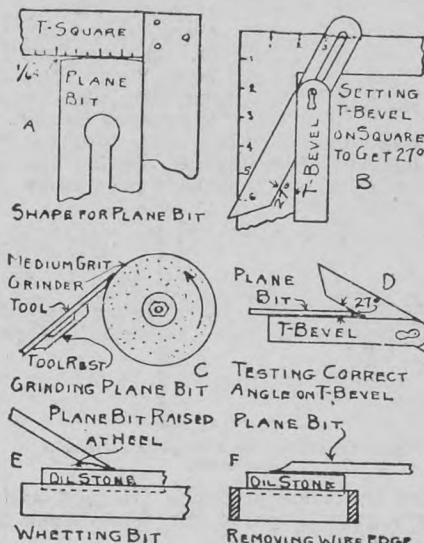
Makes Drilling Easier

The point of resistance on a twist drill is at the centre, where there is no cutting edge. If sufficient pressure is applied this is overcome but with an ordinary carpenter's brace and a $\frac{1}{4}$, $\frac{5}{16}$, or $\frac{3}{8}$ -inch drill a hole can be made in any material that will centre

punch. A heavy blow of hammer on the centre-punch will remove resistance and the need of drill pressure, only it requires to be repeated as the hole deepens. We mechanics follow-up with the punch after a few turns of brace and drill. Once a hole is opened through the metal it can easily be made the size one requires either for rivet or bolt. —P. S. Beatt, Nelson, B.C.

Planes and Chisels

A smoothing plane bit should be at right angles to its length, but rounded about 1-64 inch at the corners to prevent ridges on the planed surface, as shown. Next set the T-bevel at an angle of 25 to 30 degrees, as shown at B, and grind the bit on a medium grit-grinding wheel. Test the angle with the T-bevel D until a slight wire edge can be felt. Dip the edge in water occasionally, as overheating as shown by a bluish color will ruin the temper. The bit should then be whetted on a good oil stone, lifting it slightly at the heel E so it touches for about 1-32 back from the edge. The bit should then be rubbed flat on the stone F to remove any remaining wire edge. A plane bit should be whet-

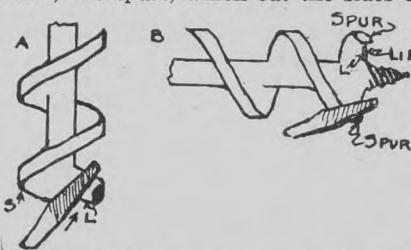


ted several times before it needs re-grinding, and less sharpening will be needed if a scraper and brush are first used on boards to remove grit.

Chisels should be sharpened in exactly the same way as plane bits, except that the corners are not rounded.—I. W. Dickerson.

How to Sharpen Auger Bits

Nearly all farmers have auger bits for boring in wood, but few know how to sharpen them so they will do good work. An auger bit has three working parts—the lips which cut the bottom of the hole; the spurs, which cut the sides of

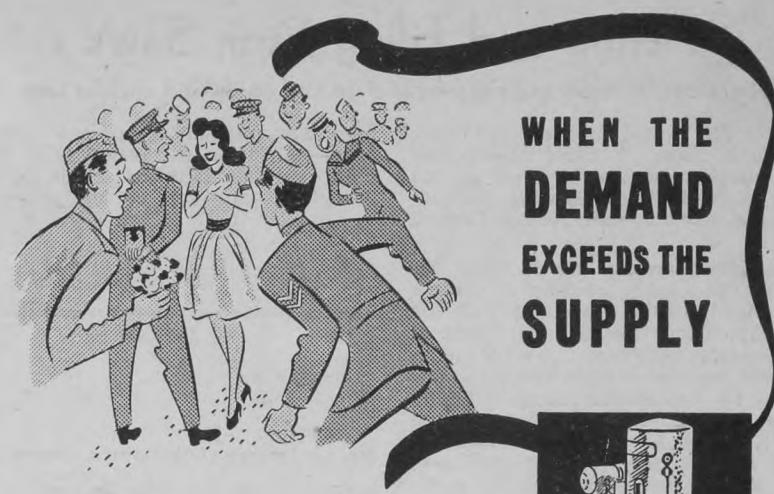


the hole; and the screw or threaded point, which forces the bit into the wood.

An auger bit file is the most convenient for sharpening, but a small taper file works very well. The lip is sharpened by resting the point on a board and then filing only on the upper surface of the lip. The spurs are sharpened by filing them on the inside only. Any filing on the outside will make the bit cut too small a hole and cause the twist to bind. If the screw is rusted or badly worn, the bit will work better if the threads are cleaned out and sharpenened with a small taper file.

Screw-driver from Bit Shank

Most farm work shops have a wood bit which is done for. A good screw-driver can be made by cutting off the auger part, leaving only the round shank which can be



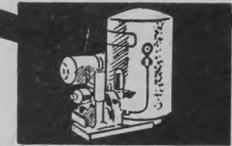
There's only one fair thing to do when you can't fully supply the demand—distribute the available goods as evenly as possible.

That is what we are doing with the limited wartime supply of Fairbanks-Morse Farm Equipment. As supplies become available, they are shipped to F-M dealers in all territories in proportions based on normal requirements.

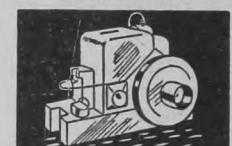
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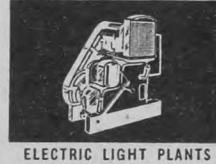
"2" ENGINES



SCALES



HAMMER MILLS and GRAIN GRINDERS



ELECTRIC LIGHT PLANTS and BATTERIES



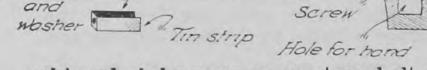
WINDMILLS and WIND CHARGERS

FAIRBANKS-MORSE FARM EQUIPMENT

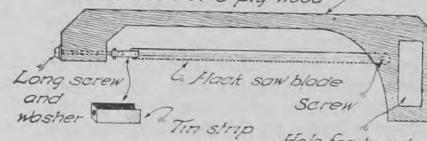
Chisel for Cutting Drums

To make a chisel that will cut oil drums, take an old 12-inch file and shape it as shown. Make it a little thicker at the end than elsewhere to give it clearance. Heat to a dull red and cool in old oil. This chisel will be

found handy for cutting any thick sheet iron.—H. Fuller, McCreary, Man.



Frame of 3-ply wood



Long screw and washer
Wood strip
Hole for hand

Frame of 3-ply wood

Long screw and washer
Wood strip
Hole for hand

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Fitting and Filing Farm Saws

Directions for hand and ripsaws, and rip and cordwood circular saws

To file a saw properly you must first have in mind the proper shape to which the teeth should be filed. The following instructions are taken in part, from a Cornell bulletin.

The first operation is not filing but jointing. To joint a handsaw or rip saw put it firmly in the saw clamp with the teeth up. Then take a small piece of three-quarter inch board, saw six inches long and two inches wide, and plane one edge until it is exactly at right angles to the side. Then take a flat file and hold it firmly on this edge. Hold the block against the side of the saw, with a file projecting out to cover the teeth and rub back and forward until they are brought to the same height. Do not file more than is absolutely necessary. It may take more than one jointing and filing to bring a badly used saw back into good condition.

The next operation is setting. For properly setting a saw, one of the sawsets on the market should be used. Just set enough to give the blade nice clearance. It will require more set if it is to be used on wet or green lumber.

Fig. 1 shows the proper shape of the teeth of a ripsaw. At the bottom is shown the set, which is here slightly exaggerated. The front or cutting faces of the teeth are at right angles to a line along the points of the teeth. This may be tested with a square as shown.

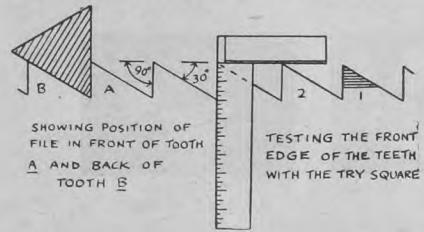


Fig. 1. Ripsaw teeth, showing angles and cutting edges.

The proper position of the three-cornered file is also shown. The file is held level and straight across, at right angles to the saw blade. The file is pressed down into the gullet and files the front of one tooth and the back of the other at the same time. Be careful to put the pressure on so as to keep the points of the teeth evenly spaced. The teeth should all be the same size and shape. File all the teeth from the same side and work from the handle toward the small end of the saw. Each tooth is brought to a sharp edge as you go along; that is, the final touches are applied to the front side of each tooth.

Some file every other tooth from one side of the saw and then turn the saw around in the clamp and finish the rest from the other side. This has to be done with a handsaw, but is not necessary with a ripsaw.

Fitting a Handsaw

In fitting a handsaw, as it is generally called, though it is a crosscut handsaw, it is first jointed and then set. The teeth are filed so that each alternate one cuts the grain of the wood on one side of the saw kerf, and the other one on the opposite side. They have therefore to be filed at a combination of angles. Fig. 2 shows these angles. Note that the handsaw tooth hasn't a cutting edge, like a ripsaw, but a cutting

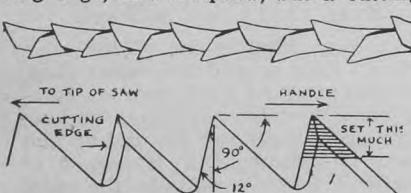


Fig. 2. Crosscut handsaw teeth, showing angles and cutting points.

point. Study closely the shape of the teeth in Fig. 2 and get a general idea of the angles.

The angles at which the file is held across the saw blade is shown in Fig. 3. It is also held with the point higher than the handle. Half the teeth are

filed from one side of the saw and the other half from the other. It is when doing the last half that each tooth is brought to the fine cutting point. Be

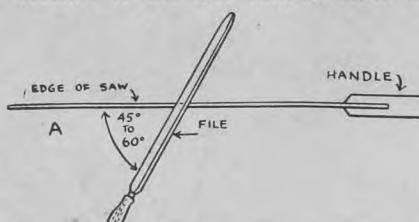


Fig. 3. Position of file across a crosscut saw.

careful as you go along to keep all the teeth as near as possible the same size. This takes care and practice.

If your saw has become badly out of condition with teeth of various sizes and gullets of various depth, Fig. 4 gives some hints on how to make the corrections. Of the four teeth shown, tooth No. 1 has just been touched up and is the right shape. Tooth No. 2 has been very much longer and much of the tip has been filed away in jointing, leaving a large, flat surface. Tooth No. 3, due to poor filing, has been left smaller than the others and No. 4 is larger than any of the others.

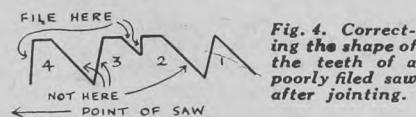


Fig. 4. Correcting the shape of the teeth of a poorly filed saw after jointing.

To file the teeth properly, No. 1 is left as it is, No. 2 is brought to a point by filing against the front edge only; the back of No. 3 is filed with the same strokes of the file as used for the front of No. 2; and No. 4 is brought to a point by filing the front edge only. The teeth are thus brought to the same size and shape.

Circular Saws

In fitting a circular saw the first thing to do is to true it up if it is out of round. This is done by holding a piece of emery or grindstone or a flat file fastened to a board, squarely across the points as the saw is rotated by hand. Rotate the saw backward. This operation is carried on until the saw is not only round but also the points of the teeth are all the same distance from the centre, so that each tooth will do its work.

The saw may be set by using a standard circular set or a hammer-and-anvil set. For the latter a piece of railroad iron may be used. From the square end of the iron, file a bevel which runs back one-quarter of an inch, and is 1-32nd of an inch deep at the end. The setting is done by two men, one holding the saw and the other using a heavy hammer. A piece of cardboard or thin piece of wood is placed on the rail under the saw opposite the hammer to keep the edges of saw tooth from coming in contact with the steel rail. The tooth is struck firmly, with the face of the hammer parallel to the bevelled surface.

A simple gauge, to measure the amount of set, is easily made by taking

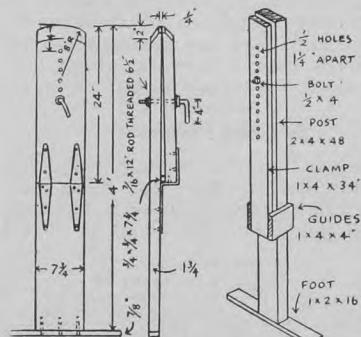


Fig. 5. Two types of circular saw clamps.

a small piece of hardwood and putting four small screw nails in it. By placing this on a flat surface one of the screw nails is adjusted to clear between a 64th and a 32nd of an inch. Then this can be used on the saw to gauge the amount of set on each tooth.

A circular saw clamp is necessary for filing and Fig. 5 shows two types

that can be made. They are simple and need no explanation. When filing they can be leaned against the workbench.

Fig. 6 shows one type of cordwood saw tooth. The front edge of the tooth is in line with the centre of the saw. The teeth are filed on a bevel and the bevel recommended is 105 degrees to the side of the saw. This bevel can be

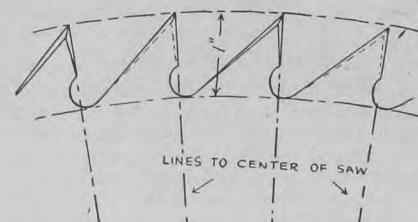


Fig. 6. Gullet type of cordwood circular saw.

found by placing a T-bevel on a steel square, Fig. 7, at 1 1/4 inches on the tongue and six inches on the blade. It is then applied to the tooth of the saw as shown in Fig. 8.

Both the front and the back of the tooth are filed from the same side with a flat file, using long, light, even strokes. When every other tooth of the saw has been filed from one side, the saw is reversed in the clamp and the other teeth filed the same way. For properly spacing the teeth of a saw that have been badly

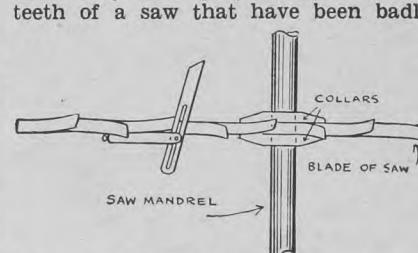


Fig. 7. Getting the bevel.

clamped and the other teeth filed the same way. For properly spacing the teeth of a saw that have been badly

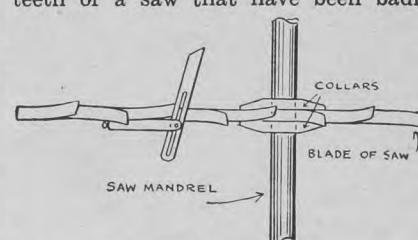


Fig. 8. Applying the T-bevel to cordwood saw tooth.

filed the same principles are used as have been described for conditioning handsaws.

Circular Ripsaws

A gullet-toothed circular ripsaw is shown in Fig. 9. It is jointed and set according to the directions already given for cordwood saws. In gumming, the gullet is ground toward a tooth seventh or eighth beyond the one being ground

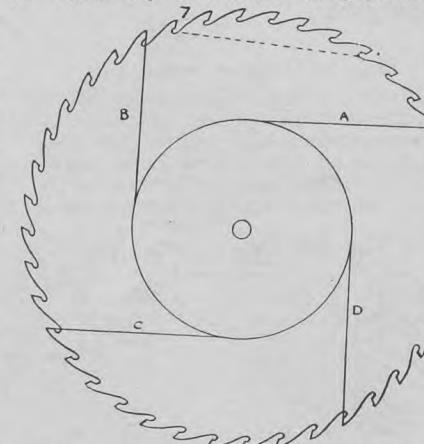


Fig. 9. Circular ripsaw of gullet type.

as shown by the dotted line at the top. Another type of ripsaw tooth is shown at Fig. 10.

In filing a circular rip saw the fronts of the teeth are filed straight across the saw at an angle as shown by the lines A, B, C and D, which are tangent

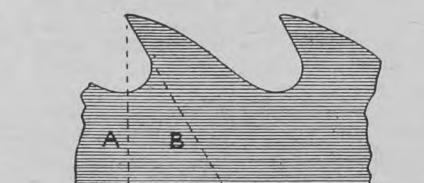


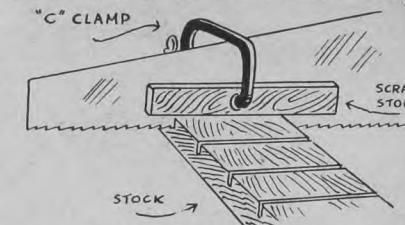
Fig. 10. Common type of ripsaw tooth.

to a circle drawn half way between the centre and the rim. Each tooth is bevelled slightly on the back.

Take one precaution. Never let the edge of the file touch the gullet. Notches interfere with the discharge of the sawdust by the saw.

Depth Guage for Saw

Fastened to the hand saw by a C clamp a strip of wood will serve nicely as an emergency depth gauge. Simply



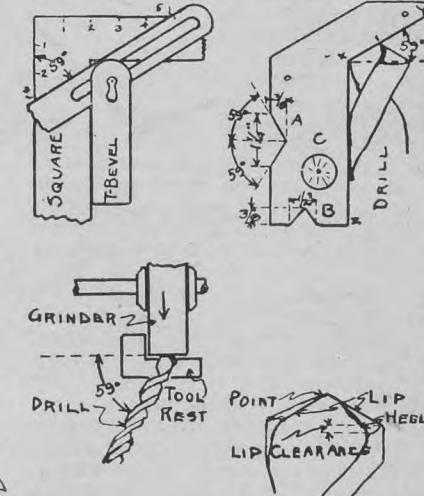
clamp the strip in place according to the desired depth of the saw cut.

One thing that should be within reach of every vise is a can of oil, nailed to the wall or on a shelf so that bolts can be dipped into it. A feather, little brush or even an old eyeglass should stand in it to oil anything which cannot be dipped. A drop of oil at the right time saves a lot of time, trouble and bolts.

Sharpening Twist Drills

Straighten bent drills by tapping lightly with a hammer on a straight surface, as a bent drill does not bear equally on the lips and is likely to break.

Grind the two cutting lips of the same length and at an angle of 59 degrees, as shown in the diagram. Keep a cup of water handy and dip the drill frequently to prevent overheating and destroying the temper. The blade of the T-bevel set at five inches and three inches on the square as shown gives the proper angle of 59 degrees. If this is laid off on heavy sheet metal and a templet cut out, it will help the beginner very much in getting the proper shape to the drill point. Check one lip for shape and mark the centre point, and see that the other lip has the same angle and that the centre is on the



same mark. Clamping the templet to the tool rest with the edge XY parallel to the grinding surface and holding the drill along the line XZ will give the proper lip angle. The 5/8 by 1 1/4 inch notch A on the side of the templet also gives the exact shape of the drill point. The 5/8 by 1/2 inch notch B gives the angle of 70 degrees for grinding a cold chisel for ordinary use.

Proper lip clearance, or the angle between the cutting lip and heel, is also very important to the proper operation of the drill. This should be about 10 or 12 degrees, but can best be checked by setting the drill point in the drilled countersink, and seeing that only the two cutting lips touch the templet, while the heels both clear slightly. The lip clearance angle should be rounded rather than straight, and is secured by holding the cutting lip to the grinder and then turning it slightly to the right.

—I. W. Dickerson

Glass Cutting Aid

Slipping of a yardstick used as a straightedge in glass cutting can be prevented to a considerable extent by wetting the surface of the yardstick before you start.

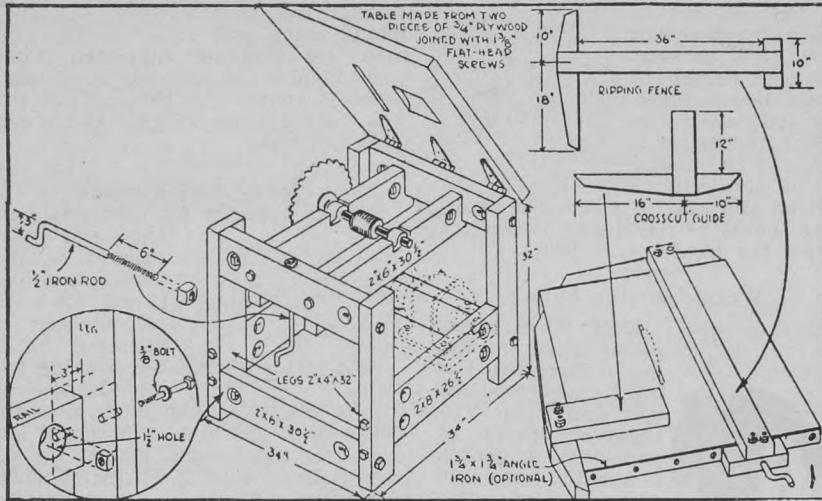
Shining Up Auger Bits

To remove rust from the flutes of an auger bit wrap a piece of fine emery cloth around a small rope and work the rope back and forth until the surface is nice and shiny. Be careful not to rub across the cutting edge of the bit.

Mounting Small Bench Saw

Cut the four legs from 2x4 stock. To be fastened as shown. Next comes the six frame members, 2x6x30 $\frac{1}{2}$ inches in size and the two members 2x8x26 $\frac{1}{2}$ inches in size. Use a square in laying out all parts and make sure your saw cuts are accurate. The method of assembling the frame pieces is detailed in the lower left-hand corner of the drawing. If you do not happen to have a 1 $\frac{1}{2}$ -inch auger bit, drilling several small holes and cutting the remainder of the wood with a chisel will do just as well. After assembling the frame, comes the mounting of the mandrel and the top which is simply a couple of

pieces of $\frac{3}{4}$ -inch fir plywood screwed together and hinged to the saw frame. Don't try to cut a slot for the saw by hand, wait until the job is finished, then lower the table over the revolving blade. Enlarge the opening to about a half inch in width with a keyhole saw or file. Assemble the crosscut guide and ripping fence from straight-grained hardwood and complete the job by giving the wood a couple coats of shellac or paint. If you have electricity, a $\frac{3}{4}$ -h.p. motor is recommended; if a gas engine is to be used you'll need one of at least one horsepower.

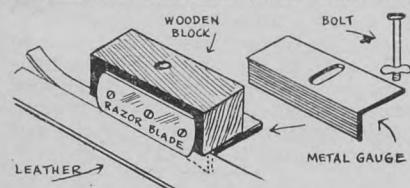


SECTION 2

Constructing Simple Gadgets

Belt Lace Cutter

A block of hardwood with a safety razor blade fastened to its side with



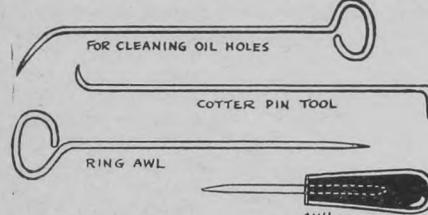
wood screws, and with a sheet metal gauge at the bottom, will make as good a belt lace cutter as you can buy. By pushing the gauge back and forth, wide and narrow laces can be cut with great speed and accuracy.—W.S.A.

Handy Depth Marker for Bit

Where several holes are to be bored the same depth a strip of adhesive tape wrapped tightly around the bit or drill at the right place will show when the hole is the proper depth and will not slip.—I.W.D.

Tools from Fork Tines

Most farms have a broken old fork or two in the scrap pile. Here are some useful tools that can be made in a few minutes from the tines. The one for cleaning out oil holes has a piece of



wire bent a mile. The cotter pin tool is useful in many ways. The awls are very useful in the workshop for making small holes and scratching lines on metal or tin. If you have no forge you can heat the tines in the stove and bend them.—George Z. Merkley, Springwater, Sask.

Leather Knife from Old Hand Saw

I made this leather knife from a piece of the blade of a discarded hand saw. I cut it out with a cold chisel and then worked it to shape with a file. I ground the cutting edge with an emery and finished the edge on an oil stone. It is very useful for cutting and trimming leather when fixing up the harness.—George Z. Merkley, Springwater, Sask.



point through the valve cap and put back on the valve stem again. Sharpen the nail, put on a handle, and you have a very useful awl."

An Improvised Level

This level is made from a short block of clear white pine, two knitting needles or straight wires and a 3-ft. length of $\frac{1}{4}$ by $1\frac{1}{2}$ -inch lattice strip. The white pine board is 20 inches long. The sketch shows the manner of assembly. This outfit, once checked to make sure the lattice strip ex-

tends parallel with the pine board, will float level on any container of water and will be surprisingly accurate. The top strip may be moved slightly up or down one wire to maintain accuracy.—Dale Van Horne.

Magnet as Pincushion

In the U.G.G. elevator I noticed an excellent pincushion. It is a magnet from an old Ford car hanging on the wall. No need to stick the pins in it. Just throw them at the magnet.—Henry D. Falconer, Glentworth, Sask.



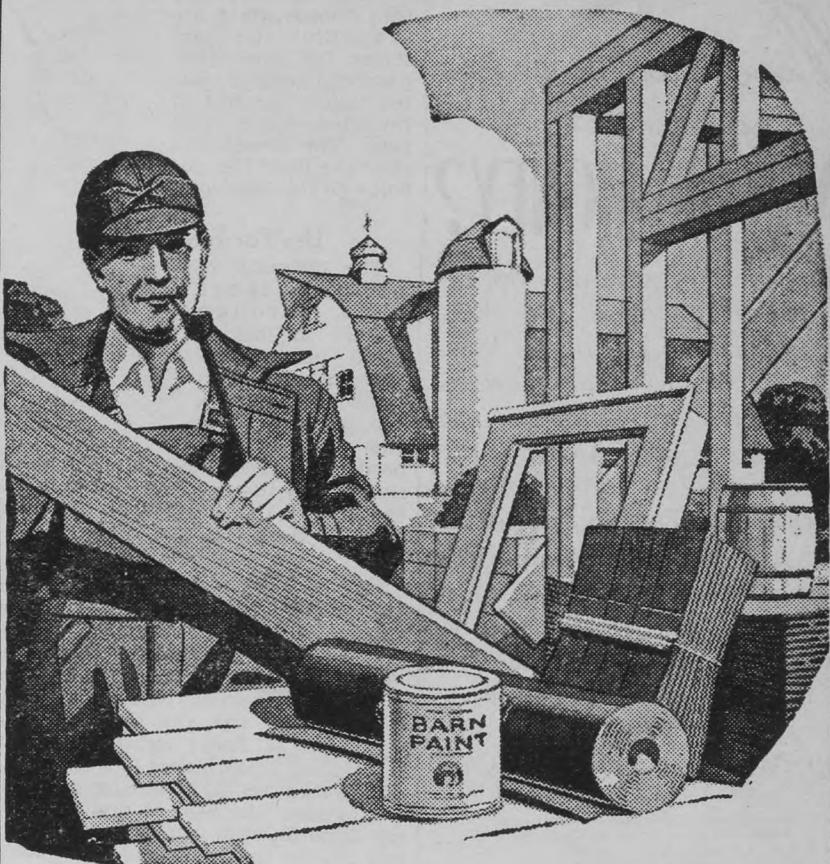
Improvised Pipe Wrench

A couple of pieces of scrap iron and a length of bicycle or motor-cycle chain are all that is required to make this pipe wrench. The two pieces of iron should be about 15 inches long and the chain about the same. The chain is passed



around the pipe and then anchored on the hook.—Paul Dannewald, Stettler, Alberta.

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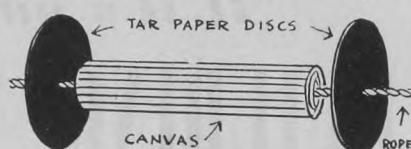
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Storing Binder Canvas

When the time comes to store the binder or combine canvases be sure to put them where the mice can't get at



them. A very simple and effective way to do it is to thread the canvas on a rope with a tarpaper disc at each end. Mice will not crawl beyond this barrier.

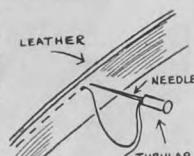
Solder Into Ribbons

To make solder into thin ribbons which are a substitute for wire solder for fine work, place the ladle of molten solder against a revolving wheel and pour. The slower you pour the finer the ribbon.—Grant Macleod.



Use For Tubular Rivet

The difficulty of pushing a large needle through leather in making small harness repairs may be overcome by slipping a tubular rivet over the end of the needle. The rivet is not injurious to the thumb and the necessary pressure can be easily applied.—Calvin Newman, Forward, Sask.



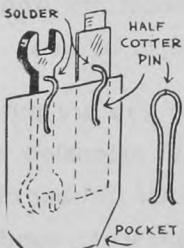
Support for Kettle

A simple but very convenient support for the large kettle used for heating water and rendering lard can be made from an old auto demountable rim. Cut three strips of heavy strap iron about 15 inches long and weld or bolt them solidly on the inside of the rim to form the legs. If preferred the rim from an auto can be used by cutting out the spokes next to rim. Such a support is easily moved and gives a firmer support than one made of stones or bricks.—I.W.D.



Pocket Clip from Cotter Pins

A cotter-pin cut in half will serve as a pocket clip for special tools and mechanics' gauges. Simply cut the pin in half at the eye, drill a small hole in the tool, insert the cut part of the pin and solder in place. This type of clip is unbreakable.

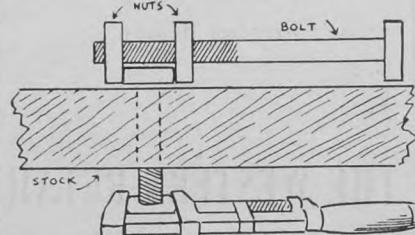


Tape Protects Work

When a file is used for fine work, there is often the danger that its other surface may come in contact with some other part of the job, scratching or marring it. This danger may be avoided by covering the idle side of the file with a strip of adhesive tape, which is easily removed when the work is finished.—Edwin Unger, Mayfair, Sask.

Improvised Wrench

When you find that the bolt to be removed is turning, and you have only one wrench, look in the machine box for a bolt, fit it with two suitable nuts, and use it for a substitute wrench. You will find that it works perfectly. The



nuts can be adjusted to the size of the nut to be removed by screwing them apart or together.—A. S. Wurz, Rockford, Alta.

Sawing Nails

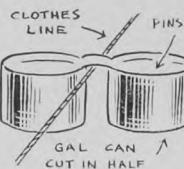
NICK BACK OF SAW WITH FILE



Sometimes, say in removing a door or window, there are nails which are hard to get at to draw out and the material may be damaged in removing it. It saves trouble and damage if the nails can be sawn. Take an ordinary three-cornered file and file a few teeth in the back of the handsaw. About a dozen teeth will do.—C. Leder, Jr., Neerlandia, Alta.

Clothes Pin Holder

A tin can cut in half, with two inches of tin left between the two halves to form a slide on which they slide along the clothes line makes a clothes pin holder that is always close at hand and easy to reach. The sharp edges should be rolled over to prevent cutting the hand.—A. S. Wurz.



Wood-Carrying Sling

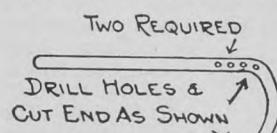
Here is a handy device which enables me to carry twice as much stovewood as with arms alone. The sling is made of gunnysack or canvas fastened to two round sticks, one of which serves as a handle, while a strap fastened to each end of the other goes over the shoulder and is adjusted to suit the user.—I.W.D.

To Keep the Wood from Flying

To keep wood from flying in your face when you are cutting it, fasten two horse shoes to your chopping block as shown. The wood will not fly and the danger of causing damage to your person is eliminated.—J. W. G., Magrath, Alta.

Two-Man Log Lifter

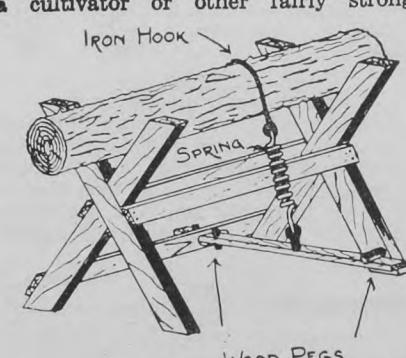
A handy two-man log lifter can be made from two shovel shanks off a discarded cultivator. Each shank is drilled



as shown with four holes to accommodate both large and small logs. The connecting bolt should fit into the hole easily, and be fastened with a nut and wing lock nut, so that it can be loosened and spun off by hand without having to look up a wrench.—I.W.D.

One-Man Saw Buck

Make out of one-fourth inch or heavier rod a hook large enough to go over the largest log you are likely to saw, fasten the hook eye to one end of a cultivator or other fairly strong

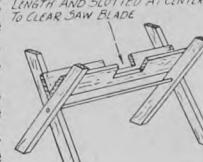


spring, and the other end of spring with a rod or chain to a rod or 1x4 stick

hinged as shown to a brace on the far side of the buck. Drive one or more spikes or pegs into the lower part of the buck leg on the near side, and adjust the length of chain so that pushing the 1x4 down and under the peg or spike will stretch the spring and hold down on the log. It sure works fine.

Sawbuck That Will Not Pinch

Here is a non-pinch sawbuck which will be found very convenient for sawing cordwood or posts, as these can be partly sawn through in the middle notch, and then are properly supported when pushed out so the stick can be cut completely through. Try this, as you will find it a big improvement over the old-fashioned type.



Handy Log Holder

Here is a handy log holder to hold logs and poles securely while blocks can be sawed off without danger of pinching. It is handier for two men, as one can lift the log while the other slips the holder back several feet. A weight laid across the other end of a short log will keep it from twisting. If desired, short sharpened nails can be driven into the holding jaws.—I.W.D.

Fence Post Sawbuck

The cut shows a simple but very satisfactory sawbuck I made out of two steel fence posts and a couple of stakes. The rough sides of each steel post is turned in, so that as the posts spring a little when the cordwood or pole is dropped between them, the projections prevent it from twisting or moving as the saw is drawn across it.—I.W.D.



Knife Sharpener

Take a five-cent mousetrap and remove everything from it except the spring. Then make a round wooden dowel 1/2-inch in diameter and equal in length to the width of the trap. Split in two, fastening one half of the dowel to the base and the other to the spring. Then take small pieces of fine carbondum cloth which are glued to the round surfaces of the dowels. Fasten to the wall and the knife is sharpened by pulling back and forth between the carbondum surfaces.—A.F., B.C.

Sharpening Gouges

If you don't have a slipstone with rounded edges, keep two or three short dowels of different diameters covered with emery cloth glued to the outside to knock the feather edges from lathe gouges. While a very slight feather edge is preferred by some, too pronounced ones only tend to make poor turning. It is essential that the inside edges of gouges be honed or ground flush when the outside is sharpened.—Dale Van Horn.



Quart Measure

An empty quart oil can can be made into a quart measure with very little



trouble. The spout and the handle are made from sheet iron and the illustration shows the pattern and the completed measure. We use one and find it handy.—M. Pilichowski, Rama, Sask.

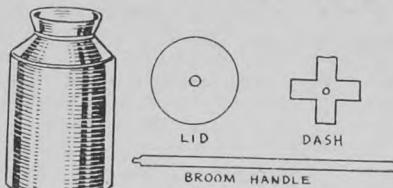
A Scissor Sharpener

Take a piece of an old broom handle about 4 inches long. Then drive a gramophone needle in the centre of one end, leaving just enough of the needle sticking out to be able to draw the scissors blade back and forth on it.

This is a very simple thing to make but I find that it will keep the scissors real sharp.—Stewart A. Glauser, Delisle, Sask.

Churn From Cream Can

A very useful small churn can be made from an ordinary cream can. The end of an apple box cut around and bevelled to fit makes a good top. For a



dash you can use the handle from an old broom and two pieces of wood two inches wide nailed together in the form of a cross. Make the cross pieces long enough so that they can be just passed through the neck of the can at an angle. My mother has used this sort of a churn for years and it works just fine

Rack for Drills

A time-saving rack for holding bits and drills can be made by boring holes in a piece of hardwood with each of the different sizes, starting with the smallest. This can be fastened above the bench and each drill kept in the hole which it fits. Marking the proper size below each hole will make it even quicker to find the proper drill.—I.W.D.

Ice Cream Freezer

The diagram shows the dasher of this homemade freezer. It is simply a piece of wood, $\frac{1}{2}$ -inch thick, 5 inches wide and 8 inches long. This is fastened to the centre standard which is $1\frac{1}{4}$ inches longer. The dash fits into a 5-pound baking powder can and the standard projects through a hole made exactly in the centre of the lid of the can. It is turned by a handle from the food chopper. The can is placed in a pail and surrounded by a mixture of ice and salt. If the can turns, tie a slip knot in a piece of cord, place around the can and tie to the handle of the pail. We have found this very satisfactory for making ice cream.—Fred. J. Parney, Rosetown, Sask.

Adjusting a Level

The diagram shows how anyone can check a level for proper adjustment of bubble. Most levels have the bubble fixed in firmly in plaster of Paris, and the easiest way to adjust an inaccurate one is to take very thin shaving off the bottom at the end towards which the



bubble moves. Use a very sharp jack plane and a try square to keep the bottom true, and check frequently for proper adjustment. Where there is a bubble adjustment, raise or lower the adjustment until the bubble moves half-way back to the centred position, and then check for proper adjustment.

Old Tape Can Be Used

Adhesive tape which is dried out and fails to stick can be rejuvenated by heating it over the cook stove. An empty adhesive tape spool makes a handy place to wind harness thread. Replacing the cover keeps the thread clean.

Handy Tack Puller

One of the handiest of my household tools is a tack puller, home-made from an old screwdriver. The end of the blade is bent sideways, the point ground fairly thin, and then a nick filed in the point with a three-cornered file.—I. W. Dickerson.

Separator Stand

Here is another use for discarded parts of an old car. A model T Ford rear housing was taken apart and the axle and bearings removed. One half of it was stood on end with centre end down and bolted down firmly. After removing the brake band and spring hanger, a piece of plank $2 \times 8 \times 12$ was bolted on top of this stand. Then it was ready to hold a small separator that is made without a stand. I have used this stand for some time.—Ronald H. Ealey, Snowden, Sask.



Simple Machinery Supports

Many a mechanic has been seriously injured by a machine slipping off a jack or blocks while working under it. A

good, solid wide-base repair stand will eliminate all chances of such accidents. The first diagram shows a very simple repair stand made from the rear axle housing of an old car by separating it at the differential joint and cutting off the wheel end at any desired length. This can be made adjustable by using a piece of large pipe which will just slip inside the housing, and supporting it on a one-half inch bolt put through holes bored through the housing at various heights.

Another diagram shows even a better repair stand where it has to be used on soft ground. The base is a discarded disc from a disc harrow or plow, and the upright is a length of 2 or $2\frac{1}{2}$ -inch pipe. The disc is placed with the concave or hollow side down, and the pipe is held in place with a one-half inch or larger bolt run through the centre hole of the disc and through a steel plate or gear on the upper end.—I.W.D.

Adjustable Stand

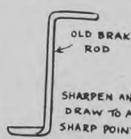
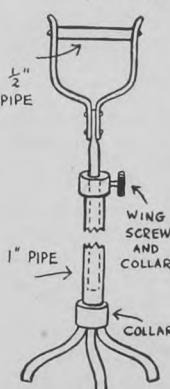
A handy stand to support long strap irons while working on them at the anvil or post drill is made with a piece of one-inch pipe. Three legs are fastened to the bottom of it and a piece of round iron is flattened at one end with two strap irons shaped as in the diagram bolted to it. A bolt is run through them at the top with a piece of half-inch pipe on

it for a roller. A collar with a winged set screw is put on top of the one-inch pipe to hold the stand at the desired height.—Roy French, Donovan, Sask.

Cutter for Spreader Beater

The diagram shows a handy device I made for cutting strings and straw when they wrap around the beater of the manure spreader.

I took a piece of brake rod from an old car. A handle about five inches long was bent on one end, and a shorter bend about one inch long on the other end. This short turn was drawn to a point and the upper part drawn to a sharp edge as shown. This part can easily be slipped under the wrapped material and a slight pull on the handle cuts it loose.



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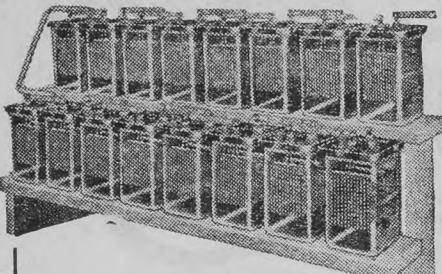
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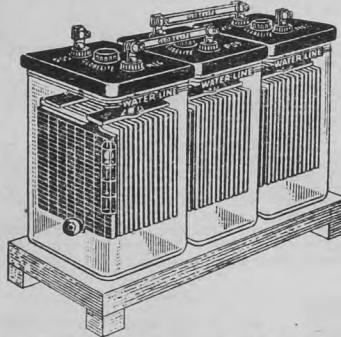
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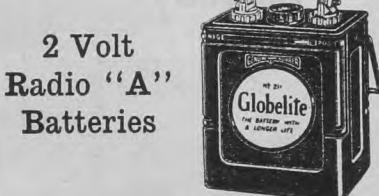
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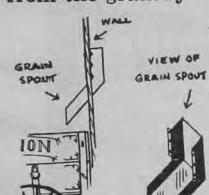
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Shovelling Chute

This is a diagram of a shovelling chute that can be rigged up for loading grain from the granary into a truck or wagon, instead of having to throw the grain through a door or hole with the spilling which usually results.

The hopper part of the chute can be made of any desired size, the chief requirement being that it is better to have the sides higher than the front. This is because you shovel the grain against the wall and what doesn't fall in the hopper or chute falls back into the granary. The hopper part should extend out into the granary a little more than is shown in the diagram, so that the grain can be thrown in more easily.—I.W.D.



the hopper part of the chute can be made of any desired size, the chief requirement being that it is better to have the sides higher than the front. This is because you shovel the grain against the wall and what doesn't fall in the hopper or chute falls back into the granary. The hopper part should extend out into the granary a little more than is shown in the diagram, so that the grain can be thrown in more easily.—I.W.D.

Handy Sack Holder

Here is a simple sack holder with which any farmer can by himself quickly sack grain needed for feed grinding, seed cleaning, seeding, etc. It consists of a light frame with two cross boards on the bottom and two across the top of the upright pieces. Two nails or hooks are driven into the upper board and on these is hooked an old coal scuttle or bucket without any bottom. The sack is wrapped around the bottom of the scuttle and the lapped part caught in a large battery charging clip or hooked over a sharpened stove bolt near the bottom. The frame is light and can be carried wherever needed, or it can be set aside and the scuttle hung on two nails driven into the granary wall.—I.W.D.

In Place of Welding

To fasten heavy wire or rods together, instead of welding, bend them into the shape shown and then put them together to form a knot. Then hammer knot closely together. This method can be used to form tie rods for granaries or barns.—H. T. Fuller, McCreary, Man.

Handy Sack Holder

This shows how to make a handy sack holder out of $\frac{3}{8}$ -inch iron rod, which any farmer can make in a few minutes

MAKE FRAME OF 8 Rod As Shown

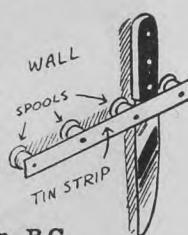
MAKE FRAME TO FIT BAGS TO BE FILLED



and which will be found very convenient where you have to fill a few sacks of grain without help. If you have any trouble with the sack not staying on the rod, two or three snap clothes pins or battery clips will remedy the trouble.

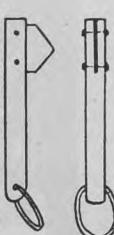
Knife Rack

A knife rack can be made with four or five spools and a strip of tin a foot or so long. The nails hold the tin against the spools and the spools against the wall. — Leonard A. Atrill, Seaton Station, B.C.



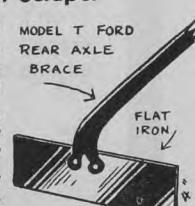
Twine Cutter

To make this handy tool take a piece of broken fork handle 12 inches long and saw a slit in one end deep enough to take a binder sickle section, which is fastened in place with rivets. In the other end drill a hole for a cord to hang it up by. It is handy when feeding bundles to stock in winter time.



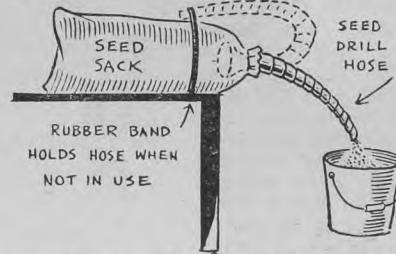
Barn Floor Scraper

This is made from a Model T rear axle brace and a flat piece of iron 4x18 inches. The brace, which forms the handle, is bolted or riveted to the flat iron and it makes a strong and serviceable scraper.—A. S. Nichol, Truax, Sask.



Improvised Seed Spout

A metal seed drill hose of the flexible kind tied into the mouth of a sack will



simplify transferring seeds, chick starter and such from the sack to a pail without spilling or untiring. A rubber band cut from an inner tube holds the spout back on the sack when not in use. —A. S. Wurz.

A Safe Milking Stool

If your cow kicks, this stool will be a great help, not to the cow but to the milker. It also makes milking easier as

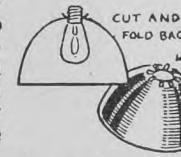
the milker is not put to the strain of holding the pail. The front support has a projecting rest upon which the pail is placed



of the seat is hollowed to receive the pail which is held in place by a loop of stout wire. Both front and rear supports must be braced; preferably by a piece of board cut to fit between them and against the bottom of the seat and then nailed firmly.—Herb. Ratzlaff, Waldheim, Sask.

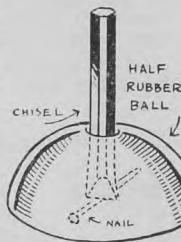
Reflector from Auto Headlight

I made an excellent reflector to go over my basement work bench out of a discarded auto headlight by knocking out the small bulb-socket, splitting the edges of the hole back slightly with pliers, slipping it over a standard bulb, and screwing it into the socket, as shown in the diagram. Good untarnished headlights can be had at any junkyard for 10 cents apiece.—I.W.D.



Safety in Cutting Nails

Have you ever tried to cut a short nail, pin or wire, and have then lost the piece when it flew away? Well, one half of a rubber ball slipped over the cold chisel as shown, will prevent this trouble. It is a good idea to make the hole in the rubber ball a loose fit so that it can be raised to set the tool on the work. —D. H. Edgeworth, Sask.



Old Funnel for Twine

One of the most convenient places in a granary to store a ball of cord is an old funnel suspended from a suitable hanger. File the end of the funnel spout to a sharp edge, letting the free end from the inside of the ball extend through the spout, as shown in the sketch.

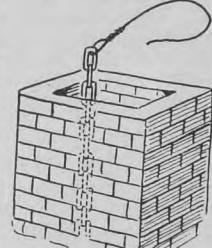


Suspending Cream Can

A handy device for suspending a cream can in a well is here illustrated. Two iron rods, with hooks at the ends, are fastened into an iron ring. The grab rope is tied on to the ring. It is much handier than using ropes only.—Hazel Metcalf, R.R. 2, Carman, Man.

Battery Handle

I made this battery handle from an old auto-top elbow. The ends were heated and bent into hooks. It hooks under the ledge on the ends of the battery, and I find that it holds well. The battery can be easily picked up and carried with it.—T.C.S., High River.

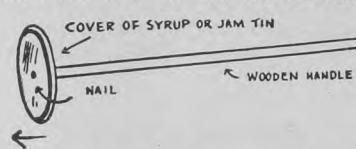


Chimney Cleaner

A piece of log-lying chain, four to six feet long, fastened to a flexible wire like a piece of clothes line, makes a very good chimney cleaner. All you have to do is to work the chain up and down along the sides and in the corners of the chimney and it loosens the soot.—A. J. Rogers, Stettler, Alberta.

For Cleaning Stovepipes

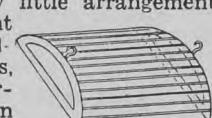
The artist who draws the workshop devices, like most other family men, has sometimes to act as handy man about his home. Here is a gadget which he constructed to clean his stove pipes. He nailed the cover of an old tin can on



the end of a piece of broomstick. The turned-over edge of the lid scraped the soot out clean as a whistle.

Stovepipe Cleaner

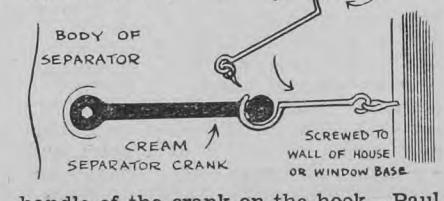
Take an old scrub brush and a strip of wood for a handle. The handle is screwed on to the back of the brush. This cleaner will make a cleaner job than pounding the pipes and the job is not so messy.—A.F., B.C.



Light Clothes Drier

This is a handy little arrangement for drying light things like handkerchiefs, stockings, etc. Take two ordinary wooden clothes hangers and attach pieces of strong wire, about 16 or 18 inches long, between them. It can be hung up near the kitchen stove.—A.B.C.

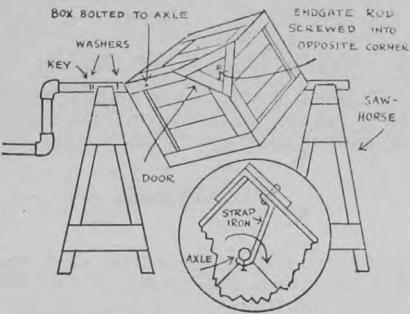
Many canvases are damaged more by mice or mildew than by use, if not properly stored over winter. Hang them on a fence or roof until thoroughly dry, then roll and hang with baling wire from barn or shed rafters where mice cannot jump to them or rain or snow blow on them. Tarpaulins and tents should be stored in the same way.



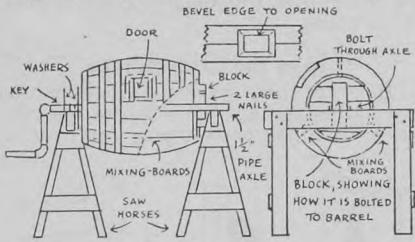
handle of the crank on the hook.—Paul Tremblay, St. Paul, Alberta.

Homemade Dusting Machines

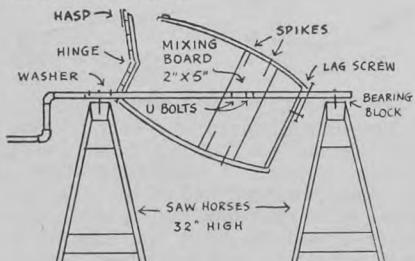
The first consideration in making a dusting machine for treating grain for smut is to have it dustproof. Three types are shown, each mounted on a pair of saw-horses, 32 inches high.



The box is about two feet square, which will hold a charge of a bushel and requires 30 revolutions per minute for 1½ minutes per treatment. The axle is 1¼-inch pipe six feet long. To make the bearings take a block, preferably of hardwood, 2x4x8-inches and bore a 1½-inch hole in the centre of the 4-inch face. Then rip the block lengthwise through the centre of the hole so that each half is 2x2x8 and has a half round bearing surface across its face for the axle. Bolt these to the saw-horses. The washers are held against one bearing with cotter pins passing through holes drilled in the axle. For the opening, cut away about nine inches from one of the free corners. The door is held in place by an end-gate rod screwed into the opposite corner and comes through the door about three inches off centre so that the door can be rotated out of the way when filling. Two pieces of ¼x1-inch strap iron are bent and attached to the box and the axle as shown in the insert illustration. These force the box to turn with the axle. The bolts which attach the box to the axle are about six inches from the corner of the box where the axle runs through it.



This duster is made from a clean wooden oil barrel. Instructions for mounting the box duster apply largely in mounting this type. The axle is four feet long. Three bits of 1x4-inch board, the length of the inside of the barrel, and shaped to fit the bulge, are spaced equally around the circumference with the door in the middle of one space. They are fastened in place with iron brackets. The barrel is anchored to the axle by bolting a piece of 2x4 to each end of the barrel and then putting a bolt through the 2x4 and the axle. For the door opening select two wide staves and cut out, leaving a bevel for the door to fit against and also leaving about an inch of each stave for rigidity. Tack pieces of discarded inner tube around the opening to make it dustproof when the door is closed.



This duster is made from an old steel oil drum or a 50-gallon barrel. One half of one end is cut out. A wooden head is made hinged in the centre and attached as shown. Make dustproof with strips of old inner tubes. The door is held closed by a hinged hasp. Bolt a 2-inch reinforcing block to the opposite end for the axle to pass through. The drum is anchored to the axle by two large lag screws six inches long, screwed into the false heads through holes drilled through the barrel and axle. A baffle board, 2x8 inches, is spiked across the inside of the drum about two-thirds of the way back from the door, placing it so that it will be up and down when the drum is in filling position. The bear-

ings are the same as in the other types and no top half is necessary.

These types of dusting machines are designed by the Dominion experimental farms system and are therefore approved by it.

Screen and Sash Marker

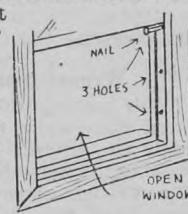
This cut shows how to mark storm sash and screens so that there will be no doubt as to where each belongs. I first tried putting a metal number on each, but these lost easily and they



were of no help when this happened. The letters are made by punching holes with a good sized nail, and they are easily legible after several paintings.

Safety Window Catch

When there are small children around the home it isn't safe to use just any old thing to prop up a window. Instead, bore three gimlet holes as shown in the sketch and an ordinary nail will hold up your window at three different openings, with no danger of broken little fingers.—George Ray.

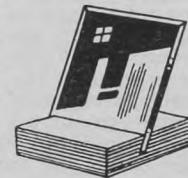


Concrete Lantern Base

Fitting your lantern with a concrete base will do much to prevent it from being accidentally overturned, especially when it is being used outside. Make a form of inch boards about 12 inches square, fill with cement mortar, and insert the lantern, making sure not to cover the filling hole. The form can be removed in two or three days.

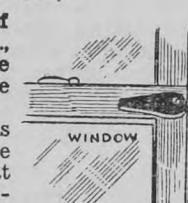
Handy Mirror Stand

A handy stand for a wall mirror to be used for shaving or on a dresser can be made from a piece of 2x4 with a slanting cut made near one end and large enough for the mirror to fit into. It can be made decorative if sanded smooth and painted to match the mirror.—M. E. Kibblewhite, Balzac, Alta.



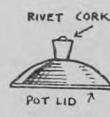
Window Stop

F. L. Peskett, of Dauphin, Man., brought this little gadget to The Guide office and says it worked well in his home. It holds the bottom sash up at any height. It is simply a bit of hardwood shaped as shown and fastened on the sash with a screw nail. It is hung as an eccentric and when the sash is raised it can be held at any height.



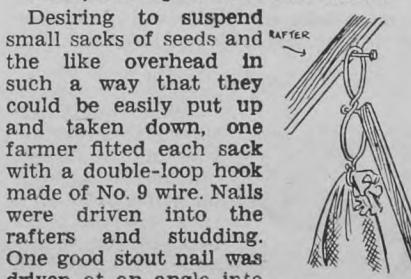
Knob For Pot Lid

When the wooden knob pulls off your pot lid just take a cork one-half inch in diameter drill hole through the centre and insert a long rivet through both cork and hole in lid. place on washer and clinch rivet so it will not pull out. This knob does not get hot, therefore saving many burnt fingers.



Suspending Sacks from Rafters

Desiring to suspend small sacks of seeds and the like overhead in such a way that they could be easily put up and taken down, one farmer fitted each sack with a double-loop hook made of No. 9 wire. Nails were driven into the rafters and studding. One good stout nail was driven at an angle into the end of a strip for elevating the bags.



smut
root rot
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CLEAN CROPS, MORE MONEY
Purify your seed with
HALF OUNCE LEYTOSAN
REGISTERED TRADE

Half-ounce LEYTOSAN is your best insurance against smut . . . the greatest single cause of crop loss the Canadian grain farmer has faced over a recent period of years.

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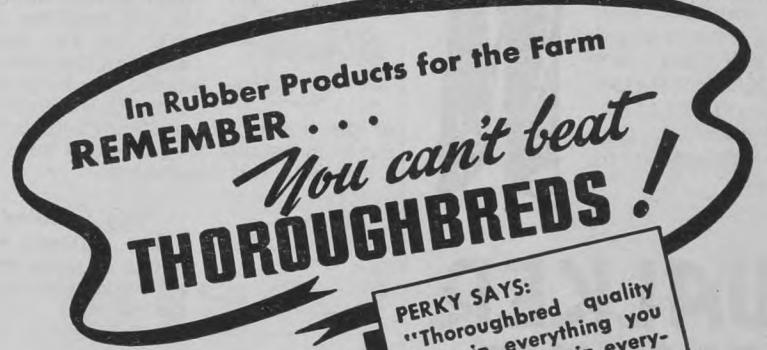
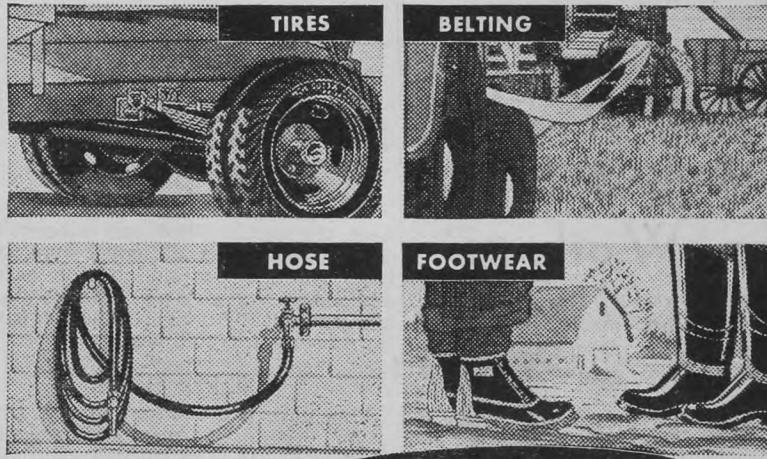
LEYTOSAN, the approved British made mercurial dust is a sure, safe and proven smut preventative . . . costs only three cents per bushel sown or about four cents per acre seeded.

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Save precious hours by treating your seed wheat, flax, oats, and barley during the winter months. Seed treated in advance with LEYTOSAN is effectively protected for months and with absolutely no ill effects or wearing off of any benefits.

Half-ounce LEYTOSAN is available in tins at your Hardware or General Store.

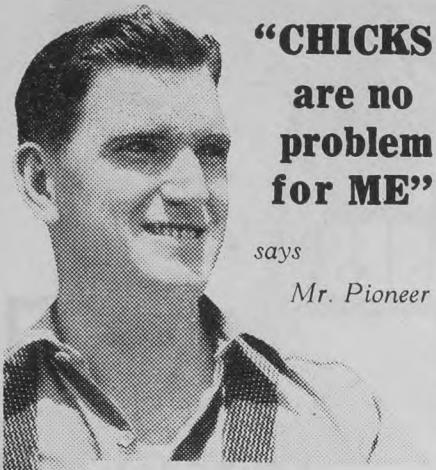
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"I can carry the little fellows along with Pioneer Chick Starter Mash till they're good, healthy laying birds. At six weeks, I change gradually to Pioneer Growing Mash, and continue with Pioneer Big 3 Laying Mash for the layers."

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**"CHICKS
are no
problem
for ME"**

says

Mr. Pioneer

Crock from Jug
To remove enough of the top from a jug to make a crock wind wrapping cord around it several times as shown in the diagram and soak the cord with turpentine. Then light a match to it. When it is burned plunge the jug into cold water and the top will split off where the jug has been heated.



Pail Holder

Clamping a hose clamp of suitable size around a smooth style faucet will prevent a pail from slipping off when it is being filled. This may be of some use to those who have water on tap in the kitchen.

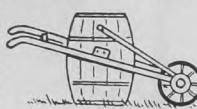


Legs for Wheelbarrow

I took the felloe from an old wheel and fitted on to the wheelbarrow, using three four-inch spikes as shown in the drawing. If fitted in right and with good wood used, it needs no further bracing and will stand hard usage. I have found that out by using this method.—D. M. Fehr, Mayfield,

Barrel Barrow

I attached two disused plow handles to an old plow wheel using a 16-inch hardwood axle. I reinforced the ends of the handles with heavy-gauge sheet iron nailed firmly over the ends. I bolted cleats on side of barrel to help carry the weight when the barrel is heavily loaded. When there are a great number of pigs to feed it is a great help.



For the Cream Can

Many farmers have a sawed-off barrel in the pump house so that the water for the stock flows through it to keep the cream cool. They find it difficult to



keep the partly filled can submerged. To avoid this difficulty bore two holes through the side of the barrel and put an end gate rod through them and through the handles. The can can't tip sideways and spill the cream.

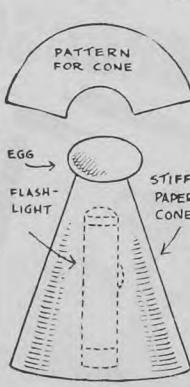
Milk Pail Holder

This milk pail holder is made from a piece of heavy wire which is bent around the pail near the top with large loops twisted in the ends as shown. The loops are curved to the contour of the legs of the milker. There is no strain in holding the pail while milking a cow with this attachment.



Egg Candler

The material required to make this egg candler is paper for a stiff paper cone. It is cut according to the pattern shown. The top opening is large enough to hold an egg without permitting it to drop through. A two-cell flashlight provides the illumination.—W.S.A. Rockyford, Alta.



Corn Popper

A very efficient corn popper can be made by taking a piece of wire window screening two-feet long and 18 inches wide. Fold over and sew the two sides together and also one end. Fine wire is used for the sewing as it is not affected

by the heat. Due to the size of the bag and the large surface in contact with the stove a large amount of corn can be popped at one time.

Emergency Thermos Jar

Drink can be kept warm or cool for a considerable time by putting it in a jar which is then placed in another larger container such as a pickle jar with the space between the two packed with sawdust or other insulating material. If you are going to a picnic the inner jar can be completely surrounded with the insulation and removed when it is needed.

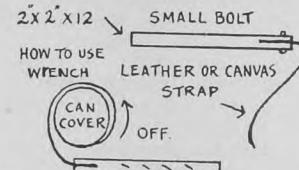
Jar Lid Tightener

All you need to make a jar lid tightener is a piece of wood and a strap as shown in the drawing. The strap is nailed to the handle as indicated.

It is a good idea to have two of these rigs, one to hold the jar and the other to tighten the lid. It can also be used for loosening tight lids.

Wrench for Screw Caps

With bottles and containers that are fitted with screw caps, it often is difficult to unscrew them and it is impossible to have wrenches to fit all sizes. The wrench shown is simply a light stick fitted with a stout whang or light



canvas strap. This can be wrapped around the cap and if necessary another one around the container, and the tightest cap loosened.—I.W.D.

Opening Stubborn Jar Tops

When the top of a sealer becomes obstinate and persistently refuses to yield to all the pressure that can be applied in the ordinary way, this simple method may turn the trick and the top. Use part of an old belt or strap with the buckle still on it.



Scriber from Phonograph Needle

A phonograph needle, used as a point in a cheap propelling pencil will serve as a very efficient scriber to mark sheet metal for cutting.—A. S. Wurz, Jr., Rockyford, Alberta.

Handy Match Carrier

Take a discarded bullet lighter, cut out the top end and take out the flint compartment at the bottom. Then you have a safe container for carrying matches in the pocket.



Hasp for Padlock

A simple hasp for padlocking doors on bins, sheds, etc., may be made of two old strap hinges by mortising one on the door and the other on the jamb as shown. The ends on the outside may be cut down to smaller length and a hole drilled in them to take the padlock. It is a good use for an old pair of hinges.



Solder Spool

Solder wound on spools is very unsatisfactory to handle unless the spool is on some kind of a rack or stand. To make a rack, take a piece of tubing about 10 inches long and split it down the middle about

and split it down the middle about

four inches with a hack saw. Open this up and drill two small holes in each end. Insert the spool of solder and push a metal pin through the holes in the fork and the spool. Now run the solder through the tubing and you have a very handy spool holder.—Wm. J. Dutka, Emerson, Man.

Handle From Piece of Hose

This is a simple way to make a handle for a drawer or small door. Take a piece of garden hose about eight inches long



and mark it 1 1/2 inches from each end. Cut the hose in half lengthwise to these marks and then, on one side, cut down crosswise to these cuts. Screw or nail the ends to the drawer or door.—L. Kemping, Drumheller, Alta.

Mouse Trap Holds Mop

A mouse trap nailed to the side of the wall will make a neat and serviceable mop and broom holder. The handles must be slightly notched to take the trap wire.—A. S. Wurz, Jr., Rockyford, Alta.

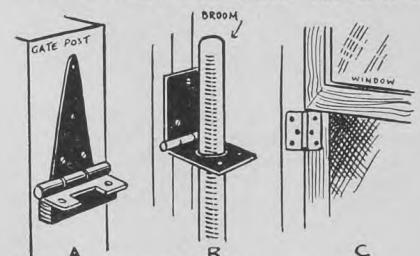
Washer Does the Trick

Lifting spring caps to fill oilers in hard-to-reach places on machines, such as the generator bearing on your car, is not at all difficult if you fit the spout of the oil can with a small washer, as shown. The washer may be soldered on, or the end of the spout spread to keep it in place.



Save the Old Hinges

Here are three ways old hinges can be used to advantage. The centre one "B" shows a hinge with a hole cut in it to



form a broomholder. On the left is a hinge notched to serve as a gate fastener. On the right the hinge is mounted to serve as a support for an open window. By mounting the hinge above the sash it can be used as a burglar latch.

Band Cutter on Pitchfork

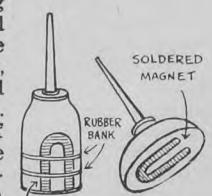


BAND CUTTER ON PITCHFORK

This is a diagram of a very convenient device for cutting bands when feeding bundles. It consists of about a 1 1/2-inch saw edge filed on the outer left edge of the pitchfork and is a big time saver, especially when the weather is cold enough to call for gloves. Simply grind or file the outside to an edge and then cut a dozen or so teeth with the file.—I.W.D.

Oil Can Holder

Always having trouble with the oil can falling off the tractor or machines, I attached a small magnet to the can. The attraction of the magnet to the metal of the machine holds the can against ordinary vibration. The magnet is held to the can by a drop of solder or by rubber bands.—Bernard Schick, Carmel, Sask.



Fishing for Piping

I have used this device to successfully fish for a length of pipe from the bottom of a 150-foot well. Take a piece of steel $\frac{1}{4}$ -inch thick and $1\frac{1}{4}$ -inches wide, and three or four feet long. A large hole is punched in one end to take a strong cable and the other end pointed to slip into two-inch piping. Two small pieces of flat steel are shaped as shown and $\frac{3}{8}$ -inch holes drilled in the ends. These pieces are bolted loosely to the bar with a steel bolt. A pin is located



under them which keeps them from dropping down. A little experimenting with a piece of piping the same size as the length to be fished for will help to get these points just right. To use: First find how deep down it is to the top of the piping. Then fasten the tool to the cable and lower it and fish away. Once hooked it will not let go, so make sure the cable is strong enough.—C.W.R., Alta.

Wheel Shuts Off Distant Windmill

By mounting an old hay rake wheel on a gas pipe and supporting the ends by posts, a farmer was able to turn on or off a windmill far down in the pasture.

A galvanized wire, supported occasionally by a pole with a hole in the top, runs from the mill to the wheel. For the portion which winds about the wheel shaft, a chain is substituted.

Since the ratio between wheel and the shaft on which the chain winds is about 35 or 40 to one, it is only necessary to weight one side of the wheel and it won't permit the mill to turn on or off without someone turning the wheel by hand. Yet a single, vigorous spin of the wheel will do either.—Dale Van Horn.

Simple Camp Stove

On a camping trip or in haying time I find this a very convenient way of cooking my meals.

Take four pieces of light strap iron, two of them two feet long and the other two 22 inches. In each end of each piece drill a small hole and rivet them together. Mark the two-foot pieces six inches from the corners and bend down to form the legs. Then drill two holes in the centre of the top cross pieces and rivet a piece of sheet metal or an old boiler lid upside down to the frame. When using, dig a hole in the ground over which to place the stove.—Hubert Busby, Donavon, Sask.

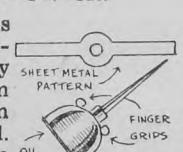
Repairing Oil Can Spout

Repair the spout of an old oil can by putting in its place the valve of an old auto tube. The inner valve is screwed out so as to provide an opening for the oil to run. Remove also the packing from the inside of the valve cap, provide an opening and screw it on as illustrated.—D. M. Fehr, Gladstone, Manitoba.



Finger Grip for Oil Can

This attachment is advantageous in handling oil cans especially of the spring bottom type. It is made from a strip of sheet metal. The ends of the strip are formed into rings for inserting the fingers. In the middle a hole is punched to fit the neck of the oil can. The can may also be hung up by the clip. It helps a lot when the fingers are greasy.—Bernard Schick, Carmel, Sask.

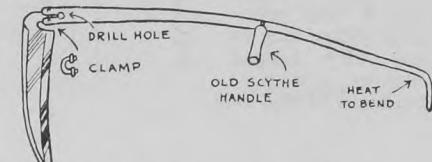


Clog-proof Oil Can Spout

When oiling out-of-the-way bearings the spout of the oil can is sometimes accidentally jabbed into grease or dirt, and becomes clogged. To prevent this, split the end of the spout and bend the two sides into a wedged shape as shown, leaving the spout openings at the sides.—D. H. Edgeworth.



Scythe Handle



An old Ford radius rod makes a good brush scythe handle. There is not much to making it. An old scythe grip is fastened about the middle and the outer end heated and bent. A clamp is necessary to fasten on the blade.—G. A. Drought, Peachland, B.C.

Nails Support Flower Pot

Driving a couple of nails in an outside window sill or table, so that a flower pot can be fitted over the nail heads as shown in the illustration, will keep the pot from being blown over by the wind or from slipping off its support.



Flower Pot Group for Martins

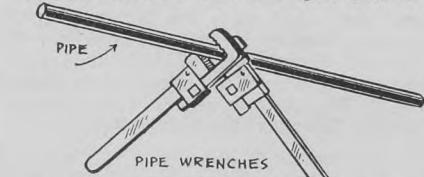
An interesting possibility in the way of a novel martin house assembly is shown in the accompanying photo of the six flower pots mounted on the single 4x4-in. upright. Requiring a compartment multiple grouping, martins are perhaps our most exacting birds. Yet they seem to welcome the cool interior of these pots when placed as shown. A single pot, however, would not attract them.

To fasten the pots to the pole, wood discs small enough to fit into the bottom of each pot was provided and a lag screw turned through the centre of each, through the pot hole and into the pole. The front of each pot was then closed with another wood disc, cut to fit and with a $2\frac{1}{2}$ -in. hole in the centre. At the bottom of each front is a perch in the form of a wood peg.

The front pieces are fastened into each pot by means of a stiff wire which runs through the edge of the disc, over the edge of the pot and is crimped under the pot flange as indicated.

Improvised Pipe Vise

The accompanying sketch shows how to assemble a handy emergency pipe vise by using a couple of pipe wrenches. Set the wrenches with the jaws facing in opposite directions and the handles spread at an angle. Put the



pipe in the wrenches as shown and with the left hand hold it firmly against the ground while it is being cut.—David Kerbs, Semans, Sask.

Glueing Clamp

A storage battery clip with slightly altered jaws serves efficiently as a glueing clamp for light wood work. The jaws are straightened out and filed even. The clamp, due to its handy size, has a wide variety of uses in a farm work shop.



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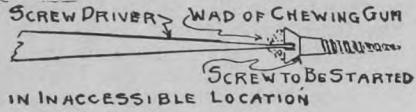
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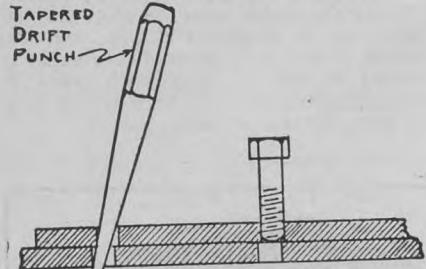
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Screw in Difficult Place

A wad of chewing gum on the screwdriver will often hold a screw so it can be started in a place that is hard to reach. Spring attachments are available for screwdriver blades for this purpose.



How to Line Up Bolt Holes



A tapered drift punch is very handy for lining up bolt holes when putting machinery together. An old fork or digger tine may be used in a pinch, but bends too easily for heavy work.

Lantern Hanger

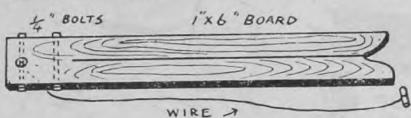
Mrs. O'Leary's cow couldn't kick this lantern down. The hanger was here when I came to the farm and I wouldn't be without it. All that is needed is a $\frac{1}{4}$ -inch rod flattened out where it is spiked or bolted to the joist. On one end



is a harness snap to hold the lantern. An ordinary screen door spring furnishes the tension. One end is fastened to the bottom edge of the joist and the other to the end of the bent rod.—Henry D. Falconer, Glentworth, Sask.

Tar Paper Cutter

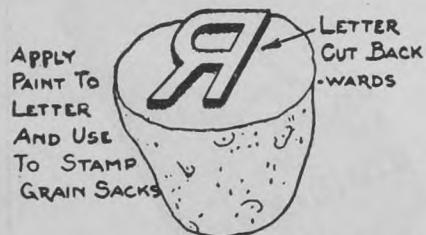
This paper cutter is made from a piece of 1x6 with a saw cut down the middle nearly to the opposite end, where it is strengthened by two $\frac{1}{4}$ -inch bolts. To the middle of one of these bolts a piece of strong, fine wire is fastened. The board is placed on the paper with



the wire underneath and then the wire is pulled up through the slit by a wooden block which is fastened on the end of it.—Arnold Smith, Peebles, Sask.

Grain Sack Stamp

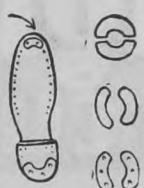
Here is a handy stamp for initialing grain sacks and other things which are likely to be mixed up when used in common. Take a potato and cut the



initial of your last name, having the letter raised and reversed as shown. Brush on heavy black paint or touch it to the paint on a board or pad, and then apply it to the sack.

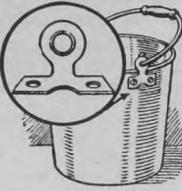
Home-made Clinkers

To make a set of clinkers for the boy's boots take a large washer, put it in the vise and saw in two with the hack saw. Then drill three holes in one of the halves, round the corners with a file and nail on to the heels. Clinkers can be made for the toes of the boots from another washer.—Otto Sanger, Allans, Sask.



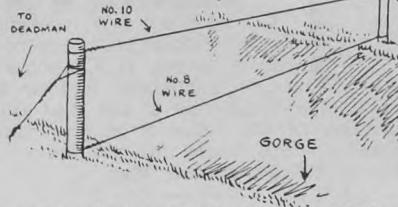
Water Pail Repair

Often the lug of a water pail gives out. This shows an easy and effective way to replace it. An old window shade fastener is riveted on the pail in place of the damaged lug.



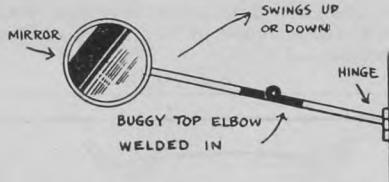
Wire and Post Bridge

An emergency foot bridge was set up quickly across a gorge by setting a post on each bank, bracing it securely, then running a No. 10 wire from post top to post top and a No. 8 wire from each post at ground level in the manner indicated.



Collapsible Mirror

Simply take an old buggy top elbow and weld it to your mirror rod as shown in the sketch. This saves a lot of



trouble when driving in narrow alleys or through a narrow door. Just swing it up or down as required.—Jacob H. Schmidt,

Cover for Cistern

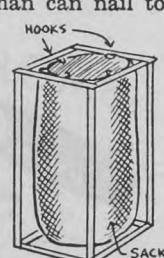
A concrete cover for the cistern will keep out all worms or insects and prevent any surface water from dripping through. A good way to ensure a tight fit between wall and concrete cover is to spread a little cement mortar on top of the wall, lay waxed or other waterproof paper on the mortar, then three or four men lift the cover and set it down on the paper strip. The mortar will conform to any irregularities in the under surface, and the waterproof paper will prevent permanent adherence. It is not necessary to have the cistern air tight, but all openings should be protected by fine copper screening so mosquitoes or other insects cannot enter.—I.W.D.

Smelly Cistern Water

When the water in a cistern develops a bad smell, it can be renovated so as to be satisfactory for laundry purposes by fixing up a good sand filter with at least 24 inches of sand and six inches of pea-sized charcoal, and pumping the water through this several times and letting it run back into the cistern. The thorough aeration and the action of the charcoal will remove the offensive smell and much of the color. Be sure all openings are covered with not coarser than 16-mesh screen, and the water will not likely give any further trouble. Clean out and wash the filter before it is used again.—I.W.D.

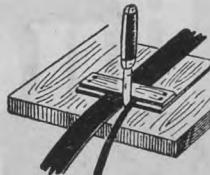
An Ideal Waste Container

The accompanying sketch shows how in twenty minutes a man can nail together an ideal, movable waste container, very useful in a house where kiddies are always cutting paper dolls or model aeroplanes—and even in the basement of the home, which is usually very untidy. Merely nail a few inch-boards together in a complete rectangle, to provide the holder; then screw in a hook on each side, turned upwards, on which the sack may be suspended and kept open. This is very convenient.—Dale O'Hara.



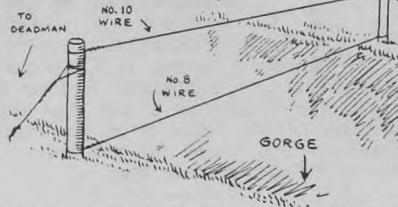
Belt Trimmer

By tacking four pieces of wood of suitable size to a board clamped to the workbench, and driving the point of a sharp knife as shown in the drawing, a jig is improvised for trimming belts. It will trim belts quickly and accurately. The two bottom pieces of the jig should be a little bit thicker than the belt and they are laid against the edges of the belt. The belt is drawn through the jig, and the trimming is complete.—Wm. J. Dutka, Tolstoi, Man.



Wire and Post Bridge

An emergency foot bridge was set up quickly across a gorge by setting a post on each bank, bracing it securely, then running a No. 10 wire from post top to post top and a No. 8 wire from each post at ground level in the manner indicated.



about half way down from the small end of each. Then I placed one of these corks on each corner of the receiver chassis and no further damage resulted.—Wm. J. Dutka, Emerson, Man.

Skein Unwinder

This skein unwinder will save Dad a lot of work and give him more time to read The Guide. The base is a piece of 2x8x14 inches. The upright is housed into one side of it. Space the holes in the arms so that skeins of different sizes will fit over the pins neatly. Make the pins with small knobs on them to hold the skein on. The upright is 12 inches from the top of the base to the axle and the arms are made from pieces 18 inches long.—J. M. Holman, Lougheed, Alta.

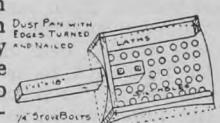
Hangers Serve as Screw Eyes

When extra hanging space is needed in the closet, lift off one of the board shelves and slide on a number of wire coat hangers, upside down. These hooks will then take other hangers on which garments are hung. The idea does not interfere with use of the top of the shelf and the hooks can be moved one way or another to accommodate thin or bulky garments. Moreover the hangers can be removed whenever desired. The idea is also a good one for camp or cabin use.—Dale Van Horn.



Ash Sifter From Dust Pan

An ash sifter can be made from an old dust pan by turning up the edges, nailing to laths and inserting a handle as shown, then fastening the handle to the pan by short $\frac{1}{4}$ -inch stove bolts.—No Name.



Dust Pan From Frying Pan

This dust pan never wears out. Take an old frying pan. With hammer and chisel cut off the front half. Hammer the bottom to a sharp edge so that the dust can easily be swept up.—A. J. Rogers, Stettler, Alta.

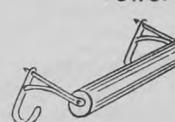


Two-key Locker

It often happens that more than one has access to a locker protected by a padlock. Not enough keys may be furnished with one lock. I simply took a strap iron link with a hole drilled in each end so that it took two padlocks. It is passed through the staple and locked at each end as shown.—D.A.M., Carmel, Sask.

Towel Roller Rack

Screw two wire clothes hooks into the wall where the towel is needed. A piece from an old broom handle will do for the roller. Cut it the length required. Through the end of each hook drive a nail into the end of the roller, or a screw nail may be used. It makes a satisfactory and tidy rack.—Mrs. D. H. Edgesworth, Sask.



A Clothespin Towel Hanger

When it comes to hanging a towel on the wall instead of using a nail why not try this? Nail one part of an ordinary spring clothespin to the wall with a shingle nail. It will be necessary to drill a small hole for the nail as these pins are generally made of maple which splits easily. The clothespin is fastened with the jaw downward and it will grasp the towel firmly. It is particularly useful where an outside wash basin is used in summer time as the towel cannot blow down.



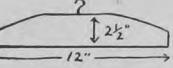
Towel Holder

To make a towel holder out of a piece of old clock or phonograph spring, straighten one end of the spring and drill a hole in it to receive a small screw nail with which it is fastened to a wooden base. The other end is turned over as shown, so that when a towel is pulled under it, the spring will grip it securely but still allow it to be pulled away.—Mrs. D. Kerbs, Semans, Sask.



Child's Coat Hanger

A swinging wall bracket was purchased for each child at a cost of ten cents each and these were placed at convenient heights in the clothes closet. Then we took the lightweight boards from the sides of an apple box and sawed them into 12 and 14-inch lengths and rounded off the top edge with a jack knife. The edges and rough places were sandpapered. Then in the middle of each we place a cup hook, purchased at 15 cents a dozen.



Improvised Tire Chains

Your old auto tires that would ordinarily be discarded can be converted into substitutes for tire chains. Divide the tire into sections as shown in the cut, marking the rubber with a piece of chalk. Saw through the tread with a hack saw and use a sharp knife to cut the balance of the rubber, being sure not to run into the bead. When the improvised chains are ready to put on, take the tires off the rear wheels, remove the tubes, slip them over the casings. Then replace the tubes, put the tires on the wheels again and pump them up in the usual way. These have proved to be very satisfactory substitutes for average use.



Kinz King Sole

Enclosed find drawing of a Kinz King sole which I find very useful and economical. My shoes had the heels too far aft and broke down at the instep. I took a piece of discarded tire from my Bennet Buggy and cut to fit the shoes from toe to heel, fastened it on securely with nails and then took a piece about 2½ inches square and nailed it on the old heel about ¾-inch forward so that it overlapped the sole. It doubled the life of my shoes, added comfort and arch support, prevented fallen arches and flat feet, gave me a better grip on gravel, more shock absorption on rocks and added about half an inch of much needed stature.



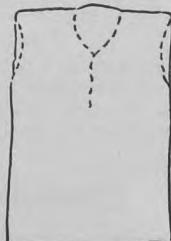
To Keep Mat From Slipping

I went to visit a friend and he had a small mat on a polished floor. I asked him if he wasn't afraid someone would slip on it and break his neck. He answered by lifting the mat. Under it he had placed several pieces of inner tube. That, he said, made it perfectly safe.



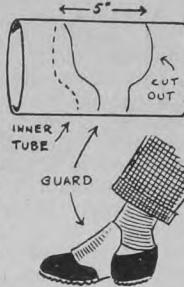
Hard Times Sweater

Maybe this is not made in the workshop, but it is a patent of my own and some of your readers may appreciate it. Take a grain bag that has outlived its usefulness and the corners have gone, turn it upside-down, cut off the corners, cut a hole in the centre and pull it over the head like a shirt. Roll up the lower end and you have the latest model of the Hard Times Sweater. It is good when the weather is cold and also when the mosquitoes are bad.—T. Jickling, Richer, Man.



Guard For Rubbers

Pieces cut from old inner tubes will help keep the feet dry and will also help keep the rubbers on when working in mud or snow. It's just another way to use a product that is usually wasted. — Mrs. D. Kerbs, Semans, Sask.



Braces from Inner Tubes

Farmers have exhibited far more ingenuity in making use of parts of old cars than the engineers have shown in making them. Here is a pair of braces, made from an old inner tube. The small piece of tin, cut as shown, acts as a shield at each end where the rubber is attached to the pieces with the button holes. It is looped, the rubber passes through the slots and the ends are fastened by using rubber cement.



Simple Camp Stove

I made this camp stove out of an old leaky washtub and a length of stove-pipe. But we do not use it camping. On hot summer days we cooked all our meals on it and even did some canning with it.— Margaret Jickling, Richer, Man.



Flexible Spout

For getting oil into places that cannot be reached with the ordinary oil can, I soldered a 10-inch piece of ½-inch copper tubing to the end of the spout. This may be bent in any direction.—I.B.D., Saskatoon.



Windmill Cutout

With this device the overflow from the full tank is drained into a small oil drum or large can. The weight pulls the windmill out of the wind. A small hole in the can drains the water back into the well. The timing is controlled by the size of this small hole. It can be made large enough to release the mill into the wind every two hours or so. The receptacle must be large enough so that it will pull the windmill out of the wind when it is full.—Kenneth Clement, Donalda, Alta.

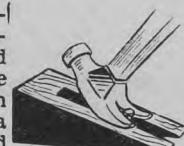
Bag Holder

This is the way to make a bag holder and filler out of an old 5-gallon cream can. Remove the bottom and then punch a half-inch hole near the bottom edge so that it can be hung on a wall or post. In the neck of the can punch three smaller holes, spaced evenly and into these holes insert belt hooks or hog rings. Clinch them, leaving the hooks on the outside of the can. By means of these hooks the bag is held firmly to the neck of the can and the bag is easily filled. The can may be hung high or low according to the length of the bag.—H.W.R., Abbotsford, B.C.



Slotted Wedge Nail Puller

A great improvement over the common practice of using a scrap of wood to push under the hummer head when pulling nails, is a slotted wedge-shaped block of hardwood. The block can be pushed under the head to suit the length of the nail.

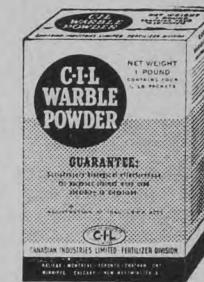


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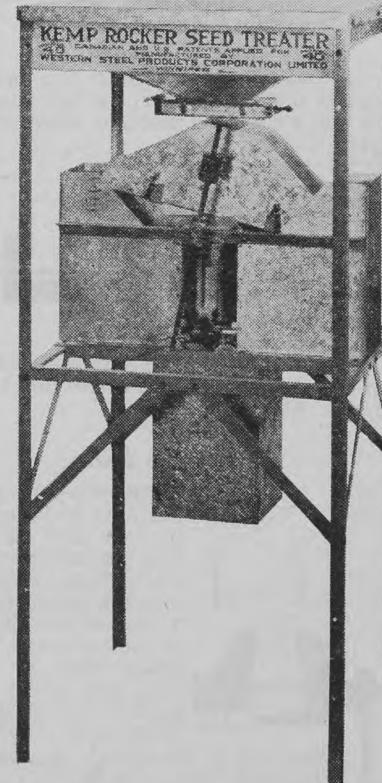


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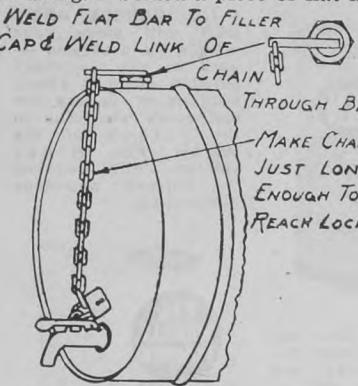
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Handy Gas Barrel Lock

The diagram shows how I have fixed my gasoline barrel so it can be locked to prevent thieves from stealing fuel either from the faucet or by siphoning it out at the filler cap by means of rubber tubing. I welded a piece of flat iron



on top of the filler cap with a heavy chain just long enough to reach to the faucet. By locking the chain and faucet together as shown, one padlock protects both places, as the filler cap cannot then be unscrewed. The flat bar also helps to loosen the filler cap if it happens to stick.—I.W.D.

Rack for Oil Drum

The diagram shows a handy rack for handling a 55-gallon oil drum. It is made of hard-wood and fastened together with bolts, the rockers are from wagon tires, and braces are heavy strap iron.

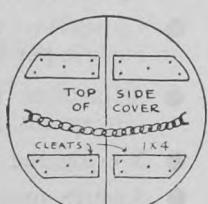
The rack is made so that the barrel or drum stands upright until gas or oil is needed, and then is tipped over onto the rockers. This eliminates all lifting and makes it a one-man job.—I.W.D.

For the Gas Drum

I have fixed up a device that makes lifting the gas barrel unnecessary. With 4x4 material a stand was made to keep the drum eight inches off the ground. I screwed a 2½-inch nipple on a ¼-inch pipe into the small end of the drum. To this I connected a ¼-inch elbow and 20 inches of ¼-inch pipe, threaded at both ends. I keep a cap screwed on the end of the pipe to keep it air tight. When I want gas I just remove the screw cap, turn the pipe to the left until the gas runs into the pail. To shut off, lift the pipe upright again and replace the cap.—Carl A. Tatroe, Sedgewick, Alta.

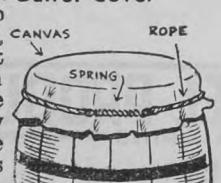
Drum Cover

This is a satisfactory cover for a drum used to haul water in. Cut two half-circles out of a 1x12 board just large enough to fit under the iron flange at the top of the drum. Put cleats on to keep the boards from splitting. Then turn upside down and put on a pair of strap hinges, so that the two boards will fold together. The top is inserted in the drum and a bit of light chain fastened near the edges pulls the boards up under the flange. This prevents the water from sloshing out. I have been using one for some time and am satisfied with it. It is my own idea.



Holding on Barrel Cover

The canvas top of a water barrel, CANVAS, ROPE, SPRING, used to prevent splashing when hauling, can be held on tight by the use of a rope with both ends tied to a spring. This avoids the necessity of tying on the cover with knots and holds it firm.

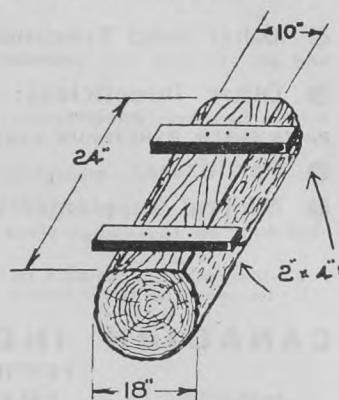


Catches Drip From Barrel

In many farm homes in winter time there is a snow barrel near the kitchen stove for the soft water supply. If it is a steel one it sweats all over when newly filled, with the result that some member of the family, usually mother, has to get down on her marrow bones and mop up the water. To check this sloppiness I cut a piece of galvanized iron about an inch larger than the bottom of the barrel and crimped the edge up all around to form a large saucer for the barrel to stand in. If the floor is not too good, bore a hole in it and solder a piece of galvanized iron pipe to the bottom. The water is then drained into a bucket in the cellar and there are no more sloppy floors.—G. F. Hinchliff, Ruthilda, Sask.

To Drain Fuel or Oil

Here is a handy way to drain a barrel of fuel or oil easily. Take a block of wood 12 to 18 inches in diameter and 24 inches long, flatten one side to a 10-inch face, and nail two short 2x4's on the face as shown. Lean the barrel



against the face so the faucet will be down, roll the block until the barrel nearly balances, and hold with a block or stone. You can now pour at your leisure, and practically no lifting is required, even with a full barrel.—I.W.D.

To Hold Cold Chisel

You assure greater safety in holding a cold chisel when cutting rivets, etc., by attaching the chisel to the end of a hammer, with a string or narrow strap around the chisel and hammer as shown.—Edwin Unger, Mayfair, Sask.

Skate Sharpener

All that is needed to make this satisfactory skate sharpener is a half-round file and a couple of blocks of wood. The blocks are about 2x2x6 inches each. A slot is cut in each to take the edges of the file, leaving the blocks as far apart as the thickness of the blade. For use, clamp the assembly in the vise and you will be able to put a pretty good edge on the skates.—Leo A. Pearce, Box 143, Hanna, Alta.

Lining Vise Jaws

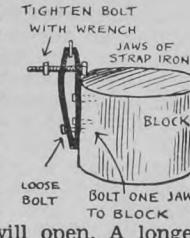
Finished parts often have to be held in the jaws of a vise. To prevent the steel jaws from marring the surface a pair of soft jaws is necessary. To make such jaws tack two pieces of leather to wooden blocks and place in the vise as shown.—A. S. Wurz, Jr., Rockyford, Alta.

Homemade Burlap Needle

The opener that usually comes with a can of sardines may be converted into a practical needle for odd jobs around the farm, such as mending sacks, harness, etc. Straighten the handle end, flatten and grind to a point. The slot in the key serves as an eye for the needle.

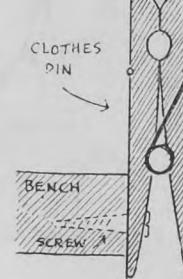
An Improvised Vise

A small vise to hold light parts can be made by taking two pieces of flat iron slightly bent as shown for the jaws. One jaw is bolted to a block or workbench and the other loosely bolted to it at the bottom so that it will open. A longer bolt at the top puts on the pressure when needed.—Thos. Atrill, Seaton Station, B.C.



Midget Vise

To make a vise for holding small parts while they are being soldered take two clothespins and screw them on to a board or edge of the work bench as shown, about 1½ inches apart. It is quickly done and serves the purpose very well indeed.—H. T. Fuller, McCreary, Man.



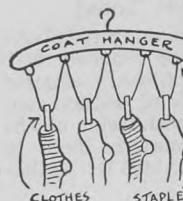
Thread Holder

This is a simple way to keep the thread from snarling on a spool. A wire paper clip is slipped into the hole of the spool and bent over. A bit of fine wire will do as well. It is fitted loosely so that it will turn around as the thread is unwound from the spool.



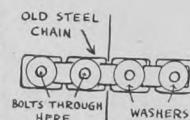
Stocking Hanger

For a stocking hanger or dryer like this all you need is a coat hanger and some small staples, a yard of cord, and clothes pins. The cord is tied to the staples in loops which pass through the springs of the clothes pins.—D. H. Edgeworth.



Hinge From Binder Chain

This is an idea I stumbled on to last fall. I needed some hinges for a door and didn't happen to have any so I tried out this idea and it worked well. I took the links of an old chain off a binder. Four of them, fastened on with small bolts and washers, made a hinge that worked very well.—C. F. Connaughton, R.R. 2, Regina.



Tightening Loose Wagon Tires



When a tire comes loose on a wagon wheel and you haven't time at the moment to get it reset you can tighten it by this simple method. Take a strip of flat iron an inch or so longer than the width of the tire, and cut V-shaped slits near each end. Then slip under the tire. The V-shaped tabs are bent over the edge of the tire and the ends of the strip down over the felloe of the wheel.—David Kerbs Jr., Semans, Sask.

Setting Buggy Tires

Now that the old buggy may be pressed into service again the tires may need setting. Take an iron about 12

inches long and an inch wide and about 1½-inch thick and rivet two studs into it near each end as shown at A-A. Now use one of the holes in the buggy tire to slip over one stud. For the other stud you have to drill a hole. Measure out the amount of set needed and bore the hole accordingly—that is, wider apart

than the studs are. Now bring the holes together just enough to fit over the studs by bending the tire up at B. Make the tire red hot at this point again and hammer the projection down flat and the tire is ready to put on the wheel.—D. M. Fehr, Muir, Man.

Broom From Wide Paint Brush

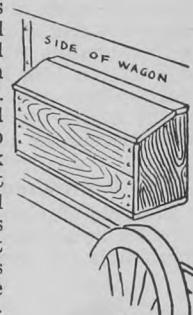
For getting into small corners I took an old paint brush and wired it to an old broom handle. With it you can



sweep in behind radiators where a broom won't go. I also found it handy for cleaning leaves and trash out from among the shrubs in the hedge.—Geo. Ray.

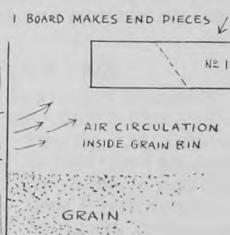
A Wagon Tool Box

This tool box is easily made and will prove useful much of the time on the farm wagon. Built of odds and ends, it is nailed to the side of the box out of the way. But four pieces of board are needed besides the sloping top. Cut the end pieces as shown, make the box long and narrow, and use either a strip of canvas belting or a piece of inner tube for the hinge. This flexible strip is fastened every inch in both the cover and the side of the wagon with shingle nails or roofing tacks.—Dale Van Horn.



Ventilator for Grain Bin

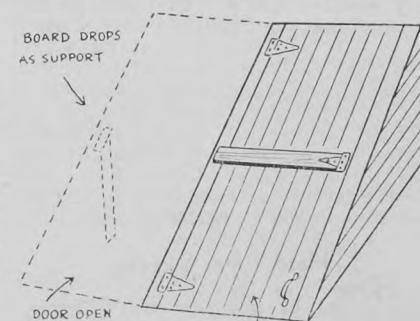
To provide ventilation over the grain in a grain bin without danger of rain or snow getting in take a piece of 1x10 or 1x12 and cut it as shown in No. 1.



This provides both ends of the ventilator. Cut away sufficient siding and nail each piece to a stud. Cover with a piece of tin which runs through the siding and on the bottom tack a piece of screen to keep birds out. A similar opening on the opposite side will provide a direct draft across the top of the grain.

Prop for Cellar Door

Half way up the door a 1x4 strip is fastened to it at one end with a T-hinge. When the door is opened this



strip acts as a prop. The height at which it is desired to hold the door is gauged by the length of the strip.—Laurence Whatley, Saskatoon.

Reflector Protects Mail Box

Just so that trucks or passenger cars will not knock your mail box down, it's a bright idea to fasten a bright reflector on the proper side of the box as shown. The little reflectors used on bicycles are good for this purpose.



Jar Protects Flashlight

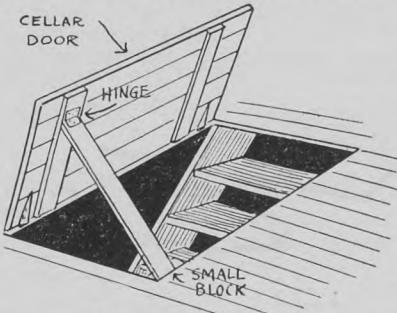
Having a sudden, urgent need of a flashlight in a driving rain at night, I first placed the flashlight, with the current on, in an ordinary large mouth pickle jar, then screwed on the lid tight.

Although more than 30 minutes were spent out in the storm, part of the time the jar being carried and more of the time with it laid down so that both hands could be used to repair a leak in the roof, there was no moisture which reached the mechanism.

The idea is worth remembering also for camping trips when flashlights not wholly weather-proofed are taken along.—Dale Van Horn.

Prop For Cellar Door

When a cellar door is in the middle of the floor there is nothing to open it up against. This is a useful gadget to make for use in such a case. When the



door is closed the prop hangs down in the cellar out of everybody's way.—Mrs. H. Feather, Grenfell, Sask.

Braces For Chairs

The backs of our kitchen chairs often broke sooner than they should so I reinforced them with a quarter-inch rod about seven inches long. The rods were flattened at the end, bent to suit and holes drilled in each end for the screw nails. With a file I rounded the sharp corners.—Frank Thiesen, R.R. 2, Winkler, Man.

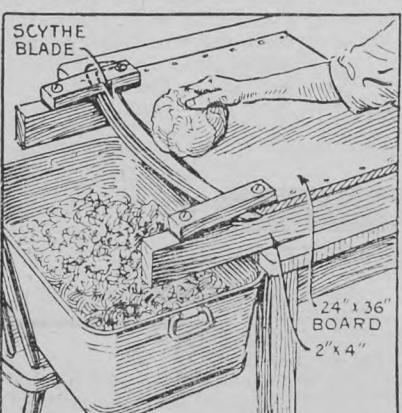
Don't Fall Off the Roof

Never take any chances of a ladder slipping off a steep roof. Here is a way to avoid all danger of that happening. The ladder is anchored in such a way that it simply cannot slip or give in any way. Before nailing on the pieces see that they are at the same angle as the roof and thus avoid strains. Then you can repair the shingles or apply the shingle stain in perfect safety as far as the ladder is concerned.



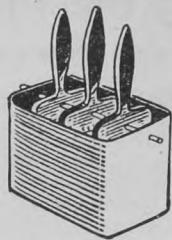
Homemade Kraut Cutter

The fellow who likes kraut made to order can have it that way by using a cutter constructed from a scythe blade and a few boards. If you will use a



little of your spare time to make up such a cutter, you can be sure of having it ready for use during this fall's "kraut making" time.

Care of Paint Brushes



Paint brushes that are used periodically can be kept in good condition if they are suspended in linseed oil or turpentine. The cut shows how it can be done. The brushes are strung on a piece of heavy wire inserted in gimlet holes through the handles of the brushes. The wire prevents them from touching the bottom of the container.

Ladder on Wheels

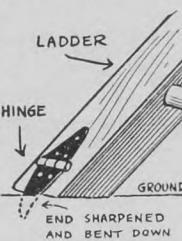
A step ladder is a handy thing to have about the farm and here is one that is mounted on running gear and is that much the handier. For painting, fruit



picking and the like it is highly recommended. Prairie farmers, with no tree fruit to pick, will not need it for that purpose, but The Guide has over 21,000 subscribers in B.C. The only requirements for making the wheeled ladder are the front wheels and axle of an old buggy or car and some lumber. The height can vary according to requirements.

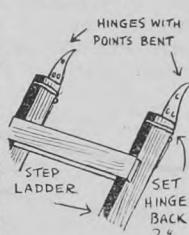
Making a Ladder Safer

An old strap hinge fastened to the foot of a ladder will prevent it from slipping on even hard or frozen ground. When not wanted the flaps can be laid back and held with a ring of inner tube. —A. S. Wurz, Jr., Rockyford, Alta.



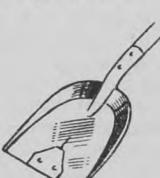
To Prevent Side Slipping

Two strap hinges, pointed as shown, will keep a ladder from slipping sideways at the top. Place the joints of the hinges two inches below the top of the ladder top. Good stout cords hold the top straps of the hinges straight while the ladder is being placed upright.—A. S. Wurz.



Repair to Scoop Shovel

If the blade of your scoop shovel cracks you can prevent the crack from enlarging by taking two discarded knife sections and riveting them over the crack, one on each side.—A. C. Embury, Baldur, Man.



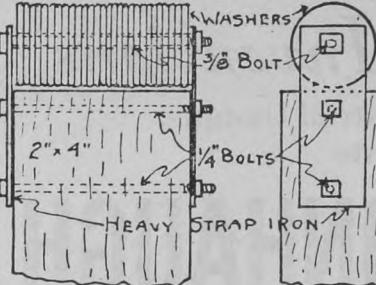
Tarring a Roof

For tarring a roof which was so small that I did not feel justified in buying a regular brush, I made one which answered the purpose just as well. It consists of an old paint brush, a garden hoe and a small C-clamp. The latter holds the brush securely to the hoe. This improvisation was assembled in a few minutes.

Emery Wheel Dresser

Grinding wheels occasionally should be trued up and the glaze removed by holding a dresser against them while

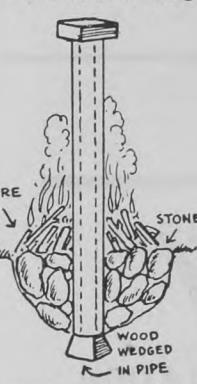
they are turned. These can be bought cheaply, or can be made from a set of



round washers as shown in the diagram. The washers can be hardened considerably by throwing them red hot into water. Fairly good results can be secured by holding the end of a pipe or bar against the wheel while it is turned.

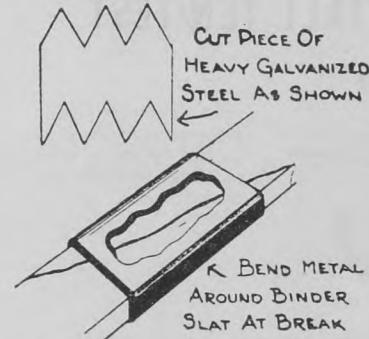
For Softening Wood

To soften a long piece of wood for bending get a piece of iron drain pipe and block one end of it with a wooden plug. Then dig a hole about two feet deep and set up the pipe in it, with the closed end downward. Fill around it with stones. Fill the pipe with water, insert the piece of wood to be softened, and build a fire around the pipe as shown. Keep the water boiling until the wood is soft.



Binder Slat Repair

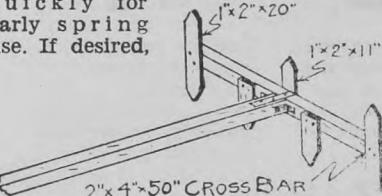
The diagram shows a quick handy way to repair split binder slats in the field so they will give considerable further service. Cut the pieces as shown from heavy gauge sheet steel, bend it around the broken slat as shown, first



turning the sharp points inward a little so in closing they will be forced into the wood slightly. If this repair is made when quitting at night and the broken surfaces first coated with liquid glue, it will be practically as strong as a new slat by morning.—I.W.D.

Handy Garden Marker

Here is a device for laying off rows in the garden which can be made very quickly for early spring use. If desired,



the markers may be made adjustable for width by bolts and a number of holes through the cross-piece.

Improvised Measuring Tool

A pencil with a sliding clip is just the thing to measure the depth of holes in castings or holes drilled in wood.

Axe Sheath



To make this axe sheath take a section of inner tube, cement it at the bottom and slit down the two sides at the top. Two slots are made which slip over the top of the axe above the handle. — G.W.D. Winnipeg.



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Putting the Harness in Shape

One place where a stitch in time saves nine

THE first thing to learn in mending leather is how to make a wax end. For harness stitching, No. 10 linen thread is used. A three-foot length can be taken. Long tapering ends are needed. Untwist the thread by rolling it on the thigh and then tease apart. For heavy work, like tugs, six or seven threads are waxed together. They are assembled, with the end of each succeeding thread slightly beyond the other. Place the assembled threads over a nail in the middle. Place a bit of shoemakers' wax on a piece of leather and put it near the stove so that the wax will melt on the leather. Then draw it over the teased out ends of the threads. The ends of the assembled threads are first waxed. The threads themselves are then twisted and waxed.

A harness makers' awl is used. The spacing can be done with a spacer, which can be purchased at the hardware store or, the idea in fig. 1 can be utilized.

It was sent in by Paul Tremblay, St. Paul, Alta. A gear from an old clock and a clothespin are used. The teeth can be filed to any size needed.

A simple harness clamp can be made as shown in fig. 2. The dimensions of A and B are given. C is $\frac{3}{4}$ -inch square, slightly bevelled. At the bottom is a piece of leather. The clamp is put in an ordinary vise when being used.

When threading the needles, which are placed one at each end of the thread, draw the tapered end through



Fig. 1. Leather marker.



Fig. 2. Simple harness clamp.

the eye two or three inches, bend the thread back and twist between the thumb and finger.

Fig. 3 shows how to cut the ends of a strap for splicing. First cut each end square. The hair, or smooth side is much stronger than the flesh side, therefore

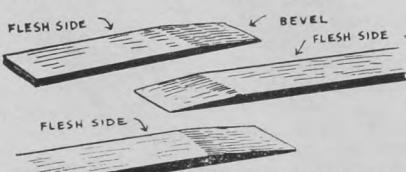


Fig. 3. Splicing a strap.

in bevelling always cut away the flesh side as shown in the upper figure in the cut. The lower two pieces are put together as shown, with the straight side of one strap placed in contact with the bevelled side of the other.

Fig. 4 shows how the stitching is done, with the two ends of strap held in place by the clamp. After marking, with a spacer or a ruler, the holes are punched with the awl, puncturing from the smooth side toward the flesh side. The stitching is done by passing both needles through the holes from opposite sides and drawing each stitch very tightly. When the last stitch through both straps is made cross over as shown, whichever method is preferred, then reverse the splice in the clamp, with the smooth side still to the right, and stitch the other edge of the splice. To finish the stitching, place the left needle and thread through as usual; then place the right needle in the hole and wind the left thread twice around the right needle and draw both ends tight. The winding will lock the threads in the leather. Make another small hole one-eighth inch below the next to the

last one on the splice and put in another locking twist. Then cut off both threads. The finish is shown in fig. 5.

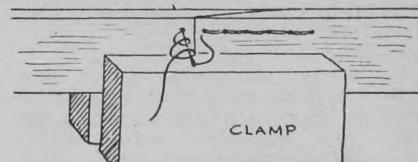


Fig. 5. Locking the threads.

To attach a buckle to a strap by riveting first cut the corners off from the end of the strap. Then mark the first hole between $2\frac{1}{2}$ and 3 inches from the end of the strap. The other one is an inch further. Punch the holes and make the slot. Bevel the end for $\frac{3}{4}$ -inch on the flesh side. Also bevel another piece at both ends for the insert. Place buckle and loop in position and rivet as shown. If a slide loop is used the strap should extend back three or four inches from the buckle.

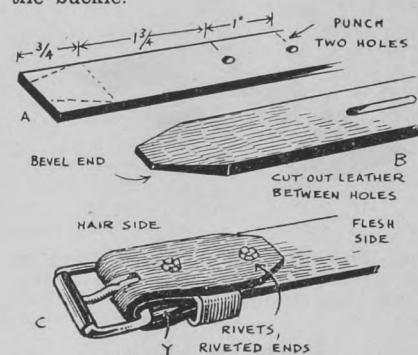


Fig. 6. Riveting buckle to strap.

In mending a broken tug a plain stitched splice will do, even when the break is at a buckle hole as it generally is. The tug is shortened the length of the splice. First square the broken ends then bevel each back six or eight inches. The stitches holding the straps together are then cut for some distance so that when the bevelled trace ends are put together the straps from one end of the tug can be placed between the straps from the other end of the trace. Place the trace in a clamp and stitch.



Fig. 7. Splicing a tug.

A simple way to splice a tug is to use a metal tug splicer. The broken ends are squared. Then lay the ends together, place the splicer on top and mark the rivet holes. Punch the holes, insert the splicer and then the rivets, being sure that the heads of the rivets are next to the horse.

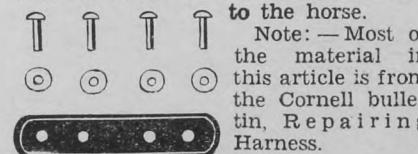


Fig. 8. A metal tug splicer.

Farm Workshop Guide contains everything that has appeared in this department since it was started. It is yours, postpaid, for 50 cents or with a \$2.00-for-6-years subscription.

When the Hay Rope Breaks

Directions for making the Short and the Long Splice

WHEN a rope breaks, and you have two ropes instead of one, it is well to know how to put them together again, end to end. You lengthen the life of the rope, and new rope isn't easy to get. But first

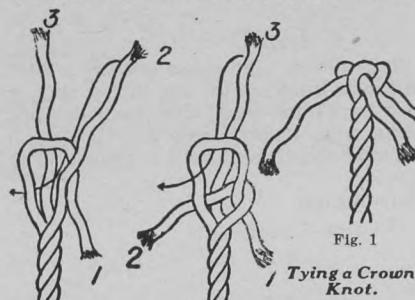


Fig. 1
Tying a Crown Knot.

let us learn how to make a knot on the end of the rope. The following instructions are from an Iowa bulletin on knots and splices.

To make a crown knot, (fig. 1) bring strand (1) down between strands (2) and (3), pass strand (2) across the loop as shown and pass strand (3) through the loop. Then pull each strand until they are all tight.

The crown knot can be made more secure by adding the wall knot as shown here (fig. 2).

The Short Splice

If there is a straight pull and the rope doesn't have to pass through a pulley, a short splice will do. The steps in making this splice are shown in (figs. 3, 4, 5 and 6). The two ends are unwound and then locked together so that those from one end pass alternately between those from the other end. Taking two strands from opposite sides, (a) and (1), (fig. 3) tie a simple knot (fig. 4). Repeat with (b) and (2) and with (c) and (3). Draw the knots tightly, then passing each strand of the rope diagonally to the left, tuck the ends under the strands of rope (y). Then turn the rope end for end and repeat by splicing down the strands of rope (y) (fig. 5). When the splice is completed each strand from both ropes should be spliced under at least two places, depending on the size of the rope and the strain it has to carry. The

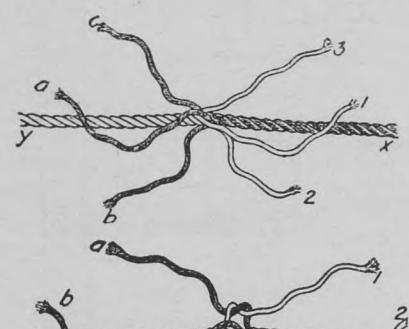


Fig. 4

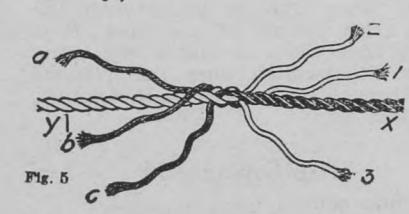


Fig. 5
Steps in making a Short Splice.

splice can be made, of course, without beginning with the overhand knots. The finished splice is shown in (fig. 6).

The Long Splice

For a long splice, a $\frac{3}{8}$ -inch rope will require a free end of about 18 inches and an inch rope, of 36 inches. The strands are locked together as when beginning a short splice, making sure that the strands are properly paired. The strands of two pairs, as (b) and (2) and (c) and (3) (fig. 7), are then tied together, leaving (a) and (1) free. Unlay strand (a) one turn and follow it by relaying strand (1) in its place, drawing it firmly and keeping it twisted tightly. Continue until 6 or 8 inches from the end of the relaid strand (1) and tie as in (fig. 11).



Fig. 7



Fig. 8



Fig. 9

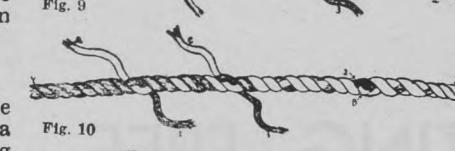


Fig. 10



Fig. 11



Fig. 12

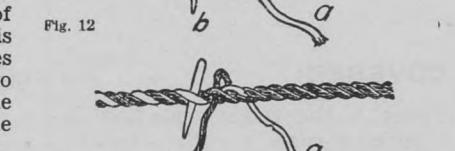


Fig. 13



Fig. 14



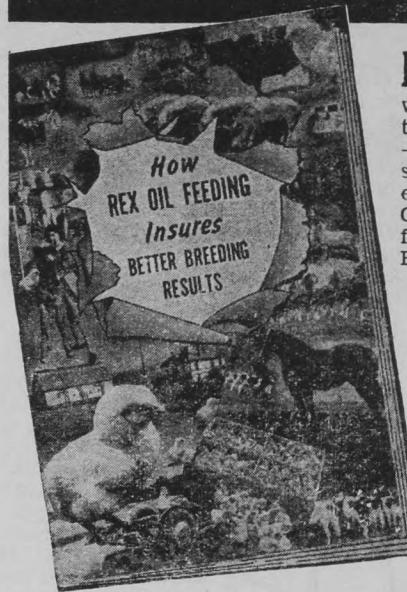
Steps in making a Long Splice.

Then turn the rope end for end and unfasten (b) and (2) (fig. 8). Repeat as with the first pair and tie. The rope will now appear as in (fig. 9), the ties should be separated the same distance and each strand coming from (x) should be placed in front of the strand from (y) and tied. Crossing the strands otherwise, as behind (1), a mistake often made, makes it impossible to complete the splice properly.

The splice is completed as follows: With the ends properly tied, (fig. 11) with the right hand overhand knot, draw down firmly into the rope (fig. 12). The end (1) is now spliced down by being passed over the first strand (a) and under the second (b) as shown by the marline spike (fig. 12), then over the third (c) and under the fourth (a) (fig. 13). Draw down end (1) and cut it off, leaving it $\frac{1}{4}$ -inch long (fig. 14). In identically the same manner splice down and cut off each of the remaining strands. The splice is finished by pounding down the uneven parts and rolling it on the floor under the foot. The finished long splice appears as in (fig. 15).

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Mending a Broken Strand

When it is necessary to mend a broken strand of rope, or replace a piece of strand that is badly worn or frayed, unlay the strand back both ways, procure a new strand of sufficient length and relay it. The directions for doing this are the same as those given for making a long splice.

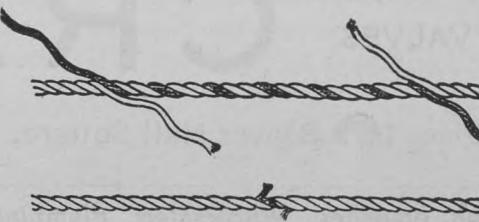
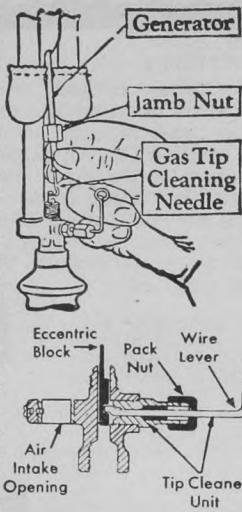


Fig. 15. The Long Splice as it appears when completed.

Reconditioning Coleman Lamp

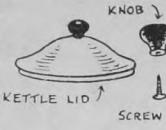
When the mantle of a Coleman lamp turns black, it is due to a lack of air. The remedy is to clean the parts, including the air intake tube, mixing chamber, burner tubes and caps. Replace any parts that are burnt out or corroded. A bent or warped generator should be straightened. It must be straight in line with the air intake tube.

Be sure that the gas tip cleaning needle is working. Carbon tends to form on the small aperture through which the vaporized gasoline passes into the air intake, where it is mixed with air. A very thin wire attached to an eccentric at the lower end, with a cat's whisker at the upper end, is built into the lamp. If the generator is plugged it may be because the cleaning needle is out of repair. It should be replaced so that the aperture will be kept clear.



Toggle for Kettle Lid

The knobs are forever coming off kettle lids, generally due to rust on the screws and nuts. A good plan is to take out the old screw and nut and put an ordinary screw into the knob from beneath. Mine has served for about a year now with no sign of coming off.—Geo. Ray.



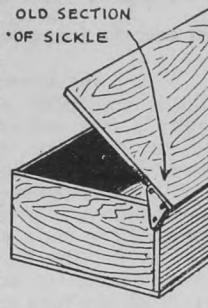
Accessory to High Chair

If a friction door catch is fastened under one arm of the swing-over tray on a child's high chair, it will prevent the child from raising the tray and upsetting his food. It will also prevent the little fellow from getting his fingers squeezed between the tray and the arm of the chair.—Paul Tremblay, St. Paul, Alberta.



Hinge for Box Lid

To make the hinges for a rough box such as is used on many farms take two old sections of mower knife or three-cornered pieces of strong sheet metal such as can be taken from an old car body and attach them as shown. These make a serviceable hinge and cost nothing if the old material is available.—Paul Tremblay, St. Paul, Alta.



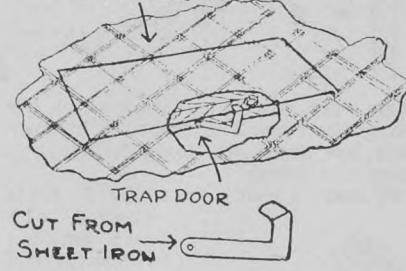
Valve Caps Are Important

Valve caps on your auto tires are more than just dirt shields, in fact they are the only positive protection you have against air leaking out through the valves. The delicate "insides" are only check valves, whereas the valve caps will hold air pressures up to 260 pounds. Never drive without valve caps and don't ruin them by tightening with a pair of pliers.

Trap Door Lifter

This device eliminates cutting a hole in a new linoleum for the lifting ring in a cellar trap door. Cut an L-shaped piece from heavy sheet iron half-inch wide as shown and drill a countersunk

LINOLEUM FLOOR COVERING



A Trap That's Always Set

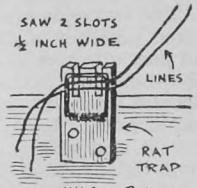
Use a pail or the bottom half of a square oil can. Grease the round can well and roll it in crumbs, wheat or seeds until it is well coated. In the bottom put a few inches of water.

The mice jump from the board to the can, which turns around and dumps them into the water.—Mrs. Velma Sanders, Balfour, B.C.

hole in one end. Fasten this with a screw to the edge of the trap door and slip it down between trap door and floor until one-half of the other end remains above the floor. Bend this over flat against the floor as shown so as to form a lip by which the lever can be raised and grasped firmly and so it will clear the floor as the trap door is lifted. The old ring should be removed and the hole filled with wood filler or putty so as to keep the linoleum from cracking over it.—I.W.D.

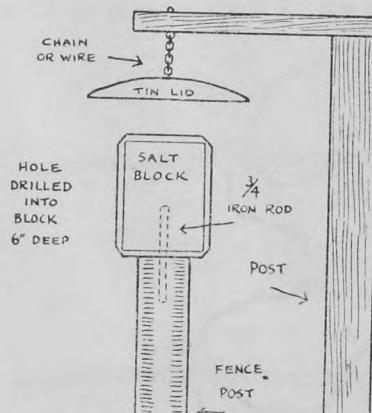
Line Holder

A good line holder for a wagon box can be quickly and easily made from an old rat trap. Two slots in the wooden base are made to make it easy to open. It is bolted to the box with small stove bolts.—Paul Tremblay, St. Paul, Alberta.



Salt Block Protection

A wooden box used for storing a salt block does not save it from waste due



to rain. This arrangement will compensate for the damage done in previous years. The tin lid prevents the rain from getting at the block. It is hung on a chain so that it will swing back into position when the livestock are through salting.—Jacob H. Schmidt, Gretna, Man.

Trap Setting Aid

I had quite a bit of trouble setting strong rat and weasel traps in the snow until I made this scissor-grip from two 6-inch spikes. The spikes are heated and flattened, holes bored and a small rivet put through. It is easy to hold the trap open with this device.—J. A. Fisher, Rocky Mountain House, Alberta.



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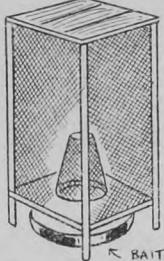
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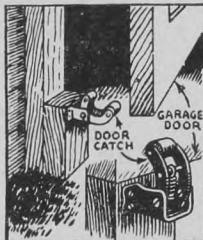
Backyard Fly Trap

Take four wooden slats about two feet long, and four inches from the bottom put a board floor with a four-inch hole in the middle. Also put a board at the top to make the frame rigid. Make a cone out of screening and place over the hole. Cover from the floor up with wire screening. Place a pan of fermented fruit or stewed rhubarb under the floor to attract the flies. It may be necessary to stake the frame to the ground to prevent the dog from overturning it.—A.P.B.



Stop For Garage Door

Don't take any chances on having your garage doors blow shut and break off the hinges, when you're backing out your car. Fit them with the handy stops as shown. Door catches as illustrated can be obtained from almost any hardware store.

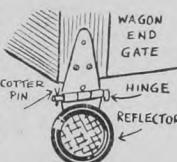


Strainer Stand

To make strainer holder for straining jelly, cottage cheese or anything that requires any length of time to drip, take four pieces of board 1 1/2-in. x 1 1/2-in., each 26 1/2 inches long; four pieces 1-in. x 1-in., 7 inches long and one piece of board 15 inches square with 1-in. notch cut in each corner and nail them together as shown in diagram. Make jelly bag of heavy cotton, to fit with four loops at top to loop over top of stand legs.

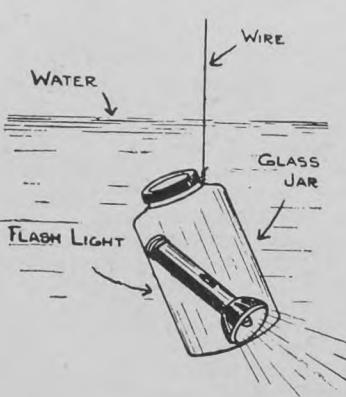
Reflector Mounted on Hinge

Most provinces have compulsory laws that reflectors must be carried on horse-drawn vehicles when travelling on highways. These are constantly being broken off when wagons are backed up to buildings, etc. To remedy this, mount the reflector on a flap hinge and screw the top part to the end gate post. If the wagon is backed up against an obstacle the reflector will swing under the wagon. A removable pin makes it easy to transfer the reflector from one vehicle to another.—A. S. Wurz.



Water Flashlight

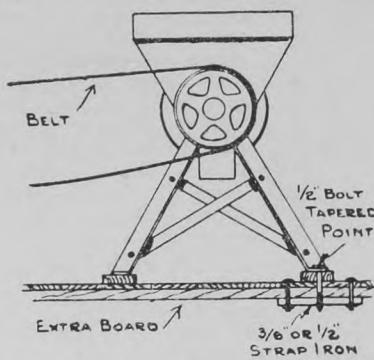
The diagram shows a flashlight to locate articles in deep water. Drop a



flashlight into a fruit jar with the light turned on, screw the lid down tightly and lower the jar into the water. The article can then be easily seen.—I.W.D.

Feed Grinder Anchor

Nail an extra board lengthwise of the joists underneath the floor, and under it bolt a piece of 3/8-inch strap iron. Tap it to take a one-half inch bolt tapered at the point so it will centre itself in the hole. This way you can line up the hole in the grinder support with the



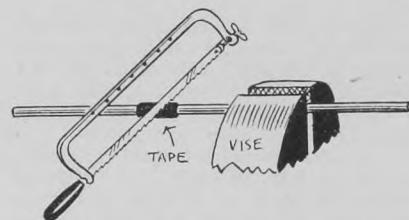
one in the floor. Drop the tapered bolt into the hole and screw it down. You can do this without having to crawl under the granary to screw the nuts on the bolts.—I.W.D.

Sharpening Scissors

Dull scissors can be touched up on almost any good quality sharpening stone having a flat surface. Apply the blade so the bevel lies accurately upon the face of the stone with the blade crossing the stone at right angles. Draw the blade smartly across the stone from the heel to the point. Start each stroke at the heel of the blade and do not run the blade back and forth.

Protecting Hacksaw Blade

Neat clean cuts without breakage to the hacksaw blade will result if a few



rounds of friction tape are wrapped around the tube when it is being sawn.—A. S. Wurz.

Aluminum Solder

To make a formula for aluminum solder take 45 per cent tin and 55 per cent zinc. File the regular soldering iron bright, heat it red hot and then solder the work. Do not use any flux or acid.—Grant Macleod.

Threading Rope Through Pulley

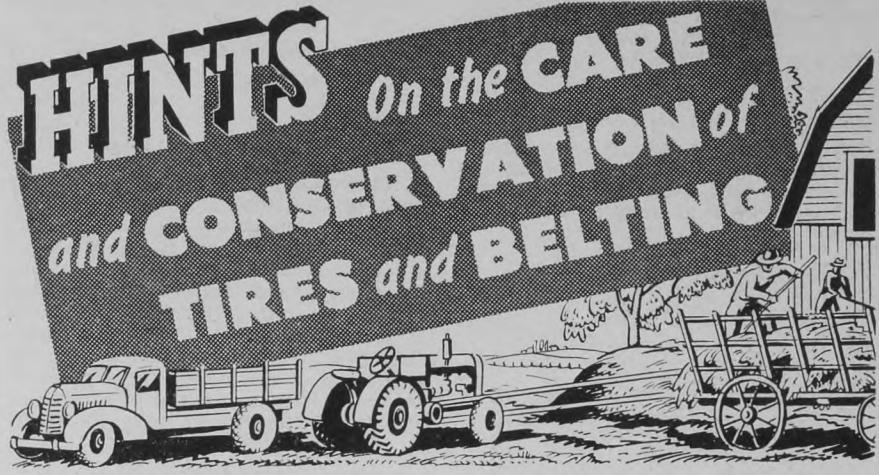
When a hay rope breaks and slips from a pulley which is suspended outside the gable of the barn, don't endanger your life and limb trying to climb up and rethread it. Instead obtain a long fishing rod with reel and line attached. Push the rod through the pulley, unreel the line to reach the ground and tie the rope end to it. Then reel in the line, pulling the rope through the pulley.

Tractor Kink

Does your tractor overheat? If so, the trouble may be caused by lime in the cooling system. The solution to the problem is to use soft water in the radiator.

Casters Stop Wall Scratching

Scratching of a wall of a barn or shed caused by opening and closing a large sliding door, may be prevented by inserting the shanks of a couple of bed casters into the door in such a way they will hold the door away from the wall. The casters will roll over the surface of the wood without marring it.

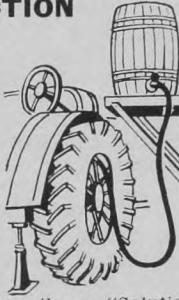


CHECK TIRE AIR PRESSURES REGULARLY

Proper air pressure is the most important factor in the satisfactory performance and maintenance of all pneumatic tires. Both under-inflation and over-inflation are harmful. Keep your tires inflated at recommended pressures. Exception: when plowing, increase inflation of furrow tire by four pounds, reduce to regular inflation when plowing is finished. Check tractor and truck tires every two or three weeks, car tires weekly.

WHEEL WEIGHT IMPROVES TRACTION

Good tire performance is dependent on the proper wheel weight. For a more efficient tractor, weight your tires by filling them 100% with liquid by Goodyear's non-freezing "Solution 100" method. With your tires 100% solution filled, your tires get greater draw-bar pull, less slippage; you save fuel, enjoy an easier ride. (For details on "Solution 100" ask your Goodyear dealer.)



INSPECT TIRES REGULARLY

Go over your tires often and remove small bits of foreign matter such as glass, stones, tacks, nails, etc., which may be imbedded in the tread. Look for cuts, tears and snags; damaged rims and valve stems. Neglect of little troubles usually result in big troubles and major repair bills.

CHECK VALVES CAREFULLY

Make sure all valve caps are in place and properly tightened. They keep dust, grit and moisture away from valve cores and do a lot to maintain proper inflation.



HAVE BRAKES INSPECTED

Poorly adjusted, dragging or grabbing brakes shorten the life of many a tire. Tires out of alignment, too, are big mileage wasters. Keep your brakes properly adjusted. Have alignment checked regularly.

SAFEGUARD INACTIVE TIRES

If any tractor, implement, car or truck on rubber tires is not to be used for an extended time—three months or more—it should be jacked up on blocks to take the weight off the tires. During shorter periods tires should be checked for air pressure before putting into service.

For Further Conservation Tips on Ways and Means to Keep all your Tires and Belts in Top-Notch Working Order . . . See your

KEEP DRIVEWAY AND GARAGE FLOOR CLEAN

Keep these areas clean of nails, screws, bolts, scrap metal, glass, sharp objects such as stones and cinders. Keep all tires clean of barnyard acids, oil and grease, spraying chemicals, etc. After hauling manure or spraying, wash tires clean with cold water. Clean off grease with gasoline, then wash with cold water.



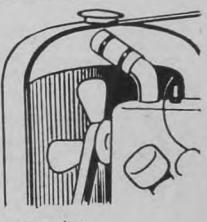
REPAIR CUTS PROPERLY

A cut tire is an injured tire. If you have no facilities for cleaning out cuts and making repairs, take your tire to your nearest Goodyear tire dealer. Remember, major tire damage and expensive repairs, generally grow from neglected cuts and bruises. The best way to save money is to have repairs made promptly. Never discard a tire without consulting your Goodyear dealer. It may be repairable.



CHECK RAD HOSE AND FAN BELT

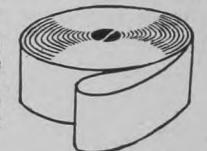
Rad hose has to be replaced occasionally. Check hose and hose connections. Keep clamps tight. Fan belts should be checked regularly (on tractors every 100 hours of operation). Loose fan belts mean overheating. A new belt is cheaper than engine repairs.



BELT CARE

When taking power from your tractor guard against too much belt tension, this can overheat and burn out bearings. Guard also against too little tension, which causes slippage and shortens belt life. Be careful of alignment. If the belt threatens to cut into front tire, jack up the far tire, or lower the one nearest the belt by digging a hole.

Belts cost money and are hard to replace in wartime. Keep them stored in a clean, dry, cool place, preferably away from light.



TO "GROUND" YOUR TRACTOR

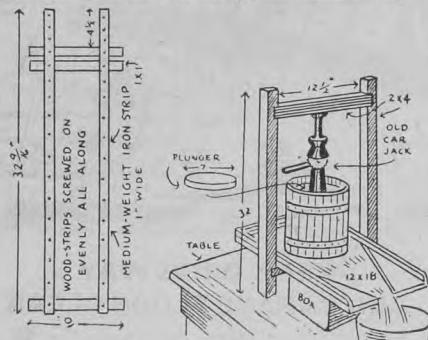
When a rubber tired tractor is operated on belt work dangerous static electricity may be developed. Ground the tractor with a chain, wire, or rod from framework to ground.

GOOD YEAR DEALER

Simple Cider Press

Several answers were received to a request from a reader for instructions on how to construct a cider press. This one was selected for its simplicity and the craftsmanship of the sender. The instructions are as follows:

"All that is needed for the construction of this cider press is two strips of medium weight galvanized iron, an old automobile jack and a supply of lumber and nails. Shape 21 strips of wood to the



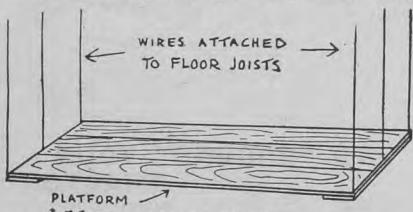
dimensions shown in the drawing. Lay them side by side on a flat surface. The iron strips project $4\frac{1}{2}$ inches past the first wooden strip and are $1\frac{1}{2}$ inches from the ends of the wooden strips. The iron is fastened to them by $\frac{3}{4}$ -inch nails, in each case after a hole has been started by using a centre punch. All but three of the wooden strips are placed in this manner. Then the other end is bent around to form a drum and the nails pass through the two ends of each iron strip while these three are being fastened in place. You have then a slotted cylinder or drum.

"The frame is made of 2×4 and must be nailed together securely. The trough is made of a board 12×18 inches with strips nailed on the sides and the back to prevent the juice from running over the sides. Then cut a circle from a $2\frac{1}{2}$ -inch plank to fit snugly into the drum, but loose enough to let it slide up and down. The drum is set exactly in the centre of the frame. A bag of burlap to fit the interior of the drum will hold in the fruit and make the extracted juice clearer.—F. A. Celista, B.C.

Buffers Protect Bumpers

With the increasing length of the automobile the old garage is often very little longer than the car. When this is the case the front bumper, not infrequently comes in contact with the end of the garage. The result is a jolt to the garage and perhaps to the occupants of the car. To avoid this mount two halves of an old auto or truck tire on the wall as shown in the diagrams. The heavier the construction of the tire the better.—J. A. Struthers, McGregor, Man.

Swinging Shelf
That wee sleekit mousie can sometimes raise Cain with his wee bit nibble. This platform is too much for him. It is three feet from the cellar floor and

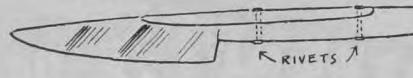


consists of three boards suspended on wires attached to the floor joist. For safety double the wires and twist them into a small cable. Ordinary telephone wire is about right. We have used the swinging shelf for 12 years without mishaps.—Henry D. Falconer, Glentworth, Sask.

Butcher-knife from Shears

I made a good butcher-knife from an old pair of sheep shears. Two can be made from one pair. Cut the loop off at the handle end. Part of a buggy spoke makes a good handle. I drilled the handle in two places and put two rivets

through the handle and the steel. It was then ground to an edge on a grindstone.—G. L. Lawrence, Powassan, Ont



Knife From a File

An excellent knife for use around the farm or on fishing or hunting trips can be made from an old file. Cut with an emery, or hammer out if you are using a forge, to the desired shape. The handle is of hard wood, maple or birch. First drill a hole in it. A ferrule may be made by stretching a small piece of brass tubing at one end and fitting over the small end of the handle. The point of the knife is then inserted in a block of wood and the handle may be safely



driven on. The knife is then sharpened and polished on a grindstone.—Edwin W. Kukkee, Stanley, Ont

Band Cutter

To make this band cutter to use while feeding sheaves take a mowing machine sickle and rivet it to the fork with a clamp. The outside tine is slipped under the band and the sickle severs the string with one push.—David Kerbs, Semans, Sask.



Homemade Spray Pump

A simple pressure type sprayer for applying chemicals to plants or trees can be made at little

cost from a small oil drum, a tire pump and a few fittings. Near the top of the drum mount a valve stem from an old inner tube. Clamp the tire pump to the side of the drum, attaching the hose to the valve stem. A $\frac{1}{2}$ -inch copper tube which extends to within about half an inch of the bottom of the drum is next soldered in position and a coupling attached, to which a 10-foot length of garden hose can be coupled. At the outer end of the hose attach a gas stove pet cock.

Handy Mail Box

Here is a very convenient type of portable mailbox. A six-foot length of $1\frac{1}{4}$ -inch pipe is bent at right angles at a point two feet from the top. This end is split for five inches with a hacksaw and the halves flattened. One half is bent upward and the other left extending straight out as shown. The mailbox is provided with a board on the bottom, then the two split halves are fastened to the bottom and end of the box with stove bolts or rivets. The lower end of the pipe is cast into a concrete block weighing about 100 pounds and wider at the base. This can be molded in an old dishpan or something similar. The mailbox should be about four feet from the ground.

When this box is placed at the side of the road, it is heavy enough to withstand severe winds without moving, and will tip over or swing to one side without damage if hit by a passing car or a load of hay. It can also be moved closer to the track in case of mud or deep snow.—I.W.D.

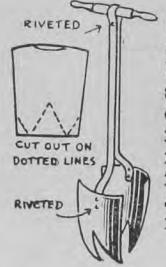
Checking Chimney

Here's a practical method of checking a chimney. Start a fire in the stove and throw on some greasy rags or other material that will make a dense smoke.

Cover the top of the chimney with a piece of sheet metal, then examine it from top to bottom for signs of smoke leaks. If any leaks are discovered take the steps necessary to put the chimney in first-class condition before giving it further use.

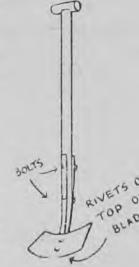
Auger from Two Shovels

A post hole auger can be made from two old shovels. The shovel blades are cut as shown and riveted to the ends of a piece of stout flat iron rod. This works all right in clay or soil that is not full of stones.—John H. Schab, Winnipeg, Man.



A Push Hoe

A piece cut from a gas barrel top, two pieces of heavy strap iron and the stem of a small spruce tree or other piece of wood are all that are necessary to make this handy push hoe. A push hoe is an excellent implement in keeping the garden clean.—C. Leder, Neerlandia, Alta.



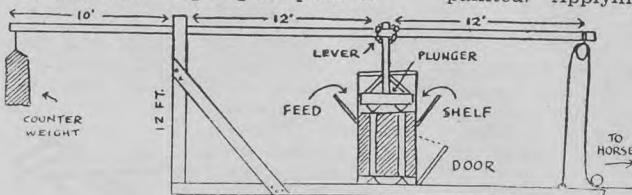
Home-Made Hay Press

The skids are about 24 feet long and are 6×6 , the uprights of the same size. The lever, which may be made from a tree, extends 10 feet beyond the fulcrum to permit the counterweight to lift the plunger to the top of the box. It must be stiff enough to stand the pull of the team, doubled by the use of a block.

The size of the box can vary. If it is 18×24 inches inside, it makes a handy sized bale. It is eight feet high. For convenience in getting out the bales it may be made 23 inches at the back and 24 inches at the front.

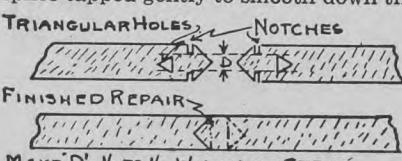
Ordinary planks are used vertically to make the box and are so placed that cracks at the back and front are left sufficiently wide for wiring. The front is cut half way up and the lower section hinged at the bottom to provide a door for the removal of the bale. The sides are left open for two feet at the top with sloping shelves to aid feeding. Lining the box with tin greatly reduces friction. An unyielding fastening for the door must be provided.

The plunger is 6×6 and six feet long, fastened to the lever with a piece of chain. The head of the plunger should fit loose in the box and be well braced to the plunger. The procedure is to shove as much hay into the box as possible, give a good steady pull, then back the team up and fill again as often as necessary. As the team backs up the counterweight will lift the plunger. With this outfit two men can make 60 bales a day, each weighing 100 pounds.



Quick Repair for Broken Strap

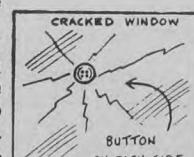
A satisfactory emergency repair for a broken strap can be made as shown. If the work is neatly done and the finished splice tapped gently to smooth down the



parts, it does not look bad at all. Of course it should be sewed or riveted at the first opportunity.—I. W. Dickerson.

Repair For Window

Sometimes a pane of glass is badly cracked but none of the glass is knocked out. It can easily be fixed by using two buttons, one at each side, at the point where the cracks



converge. The buttons are simply sewn together.—John G. Kleinser, Raymond, Alta.

Keeping Hay in Manger

Most cows and many horses have a tendency to push hay out over the top of the manger, making it necessary to put it in again or let them go without

enough hay. There is also more or less waste of hay and silage. We have practically eliminated this trouble by putting a 1×6 -inch board the entire length of the manger, nailing it flat on the top edge of the

manger. When the hay is pushed up against the board, it simply drops back into the manger, and the waste is prevented. For concrete mangers, a 2×4 could be bolted to the manger and the board nailed to it.—I.W.D.

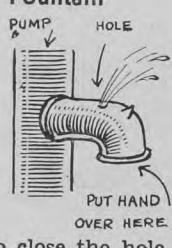
Battery Cap Lifter

We find this easily made gadget very handy in lifting the corroded caps from a car battery. Material one-eighth inch thick or thinner can be bent cold but as this is rather thin, use a nut on the inside of the gadget for the bolt to go through. Slip the points under the clips and turn the bolt and off they come.—Sidney Ransom, Sr., Mountain-side, Man.



A Drinking Fountain

Holding your hand over the spout as shown, forces water up through a hole drilled in top of the pump spout, to form a sanitary drinking fountain. A cork or plug should be provided to close the hole.



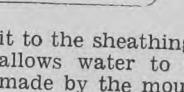
Applying Corner Boards

In applying wood siding there is a right way and a wrong way to put on the corner boards. Drawing A shows the

right way to install a corner board. The board rests directly on the sheathing itself being separated from it by building paper only. Ends of the siding should butt directly against and they should be

corner boards as shown will prevent the formation of small water storage pockets at the joint. Drawing B shows the wrong way to install corner boards. Applying a corner board to the siding rather than nailing it to the sheathing is poor practice as it allows water to seep into the pocket made by the moulded top of the siding which runs under the corner board.

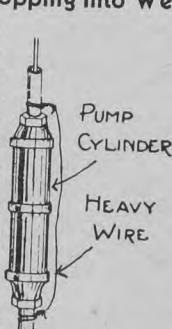
the corner board painted. Applying



it to the sheathing is poor practice as it allows water to seep into the pocket made by the moulded top of the siding which runs under the corner board.

Keeps Pipe From Dropping Into Well

If you have trouble with your pump coming apart so that the pipe below the cylinder drops down into the well, where much time is required to fish it out, you can remedy the trouble by twisting a heavy wire several times around the upper end of the lower pipe, and then looping it around the drop pipe above the cylinder. It would be even better to fasten a hose clamp tightly around the lower pipe, so that there would be no possible chance for the pipe to slip through the lower wire loop.—I. W. Dickerson.

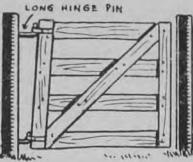


SECTION 3

Gates, Fences, Clotheslines

Self Closing Gate

A farm gate that is self closing is made like an ordinary gate except that the top bar is four inches shorter than the bottom one. Also the upper hinge pin is longer than the lower one by the same amount. When the gate is swung open the latch end will be elevated so that it will swing shut of its own weight no matter how much or how little it is opened.—Bernard Schick, Carmel, Sask.

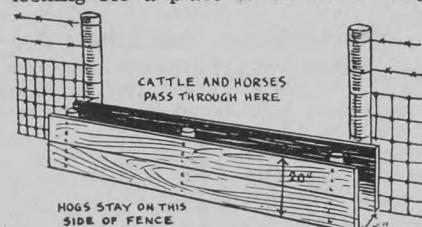


Improved Wire Gate

Here is a handy wire gate that is not hard to open. We use them all the time. Fasten the cross rail to the upright 2x6's and let it project past the post, dropping it behind the bent strap iron. This gate can be made any length or height and with as many wires as the farmer wishes.—T.C.S., High River, Alta.

"Cattle Preferred" Gate

In cases where it is desirable to keep hogs from going into the field with horses or cattle, try using a gate built along the lines shown in the sketch. As there is considerable strain on such a gate it should be made with planking. Horses and cattle will step over it, but hogs go to one end or the other. In looking for a place to come out they



simply walk through to the other end and arrive on the same side of the fence. Hog psycho-analysts assure us the I.Q. of a hog is so low that he will never know that he is being tricked.

Child-proof Gate

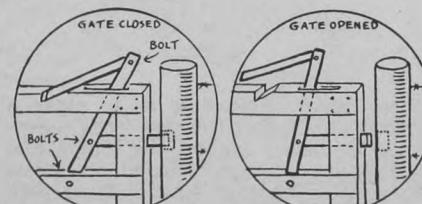
Our little girl got the habit of going out through the garden gate and getting into danger. I stopped that by putting an ordinary snap on the gate and a ring in the post. By the time she is big enough to undo the snap she will be more able to take care of herself.—Geo. Ray.

Gate Latch from Old Hinge

Old hinges make good gate latches when used in the manner shown herewith. After being slotted with a cold chisel the hinge is mounted on either the gate or the post and a good heavy staple provided to hold the latch bolt. Fasten the bolt to the gate or the post with a bit of string and all danger of dropping it is avoided.

Horseback Girl's Gate

The only iron on this gate latch is three bolts and a piece of strap iron for

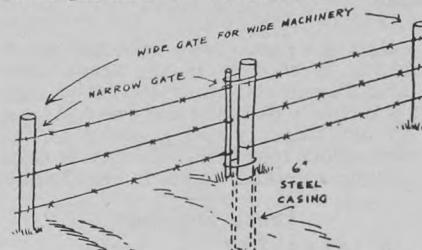


the upright. The gate may be closed and opened from the saddle. It is much handier if the gate is made to swing both ways.—Horseback Girl, Northmark, Alta.

Old Horseshoe for Gate Hanger

Oft-times farmers fence in fields temporarily, or erect light fences that have equally light gates. An easy way to hang a light gate, and still make it secure, is to use four old horseshoes, mounting two on either gate post. If the gate is made of light wood, it can easily be hung on the horseshoes, and to open, merely lift it off its hangers. The farmer who used this idea told the writer it was one of the finest tricks he had ever employed.—Grover Brinkman.

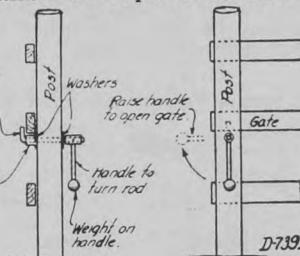
Widening the Gateway
Now that nearly every farmer has wide tractor machinery the narrow gates provided for horse-drawn outfits



are not wide enough. To remedy this set one of the gate posts into a six-inch iron pipe. When drawing one of the wider outfits simply take the post out of the casing and you have twice the former width. It will be necessary, of course, to rearrange the bracings of the posts.—A.S.W., Alta.

Drive Gate Latch

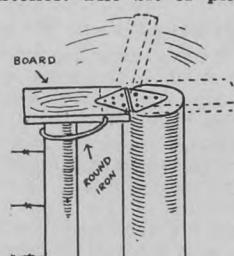
This gate latch will hold the gate securely. A half-inch rod goes through the post and is bent up to hold a bar of



the gate. A bit of pipe the thickness of the gate bar is used as a spacer. A handle with a weight holds the latch in the closed position by gravity. Details are all given in the cut.—I. W. D.

Wire-Gate Tightener

This is another way to make a wire-gate fastener. The bit of plank is 4½



inches wide and 20 inches long. Fasten it to the gate post by means of a hinge. It gives a good purchase in tightening the gate.—Vernon E. Hotz, St. Boswell's, Sask.

Stile for Wire Fence

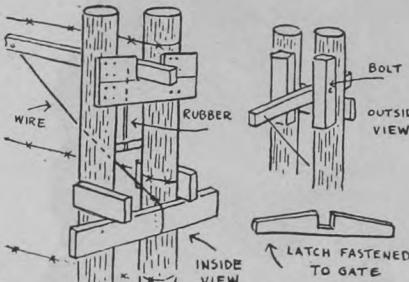


This plan provides for building the steps right into a wire fence. The top step rests on a fence post and a post is set under each end of the top step. The stringers are put in place and the remaining steps are slipped through between the wires. If any of the upright wires are in the way they may be cut

to let the step in. The horizontal wires should not, of course, be cut.—Mrs. Dan Harris, Edgeworth, Sask.

Foot-opened Gate

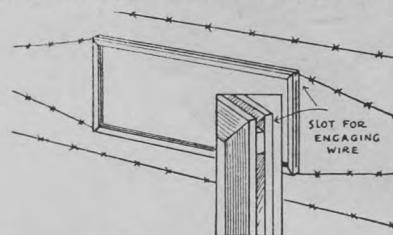
When you are coming through a gate with your arms full it is handy to have a gate that you can open with your foot. This gate opens with the foot from either side. The fastening on to the gate slides under the part of the latch which is fastened between the twin gate posts. A piece of rubber from an old inner tube pulls the latch down when the gate is shut. The cross piece projects out on each side to put your foot on.



The gate should be on hinges that will allow it to swing both ways. The cross piece would be best notched to take the two short pieces that project from the posts so that it would not get out of place.—Evan Price, Hemaruka, Alta.

Loophole in Fence

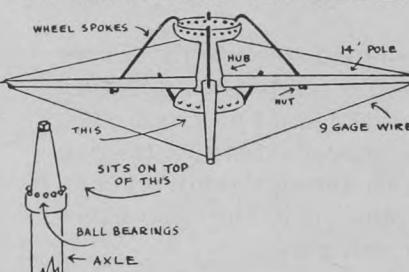
Popular Mechanics must have received this idea from a prairie farmer who knows what it feels like to get his overalls caught on barbed wire. It is a double frame, which slips in between two strands of the wire and through which



the passage can be made from one enclosure to the next without engaging the barbs. One precaution seems necessary. It should not be placed opposite any tempting mouthful of green feed or the old cow, reaching for it, and finding she was also protected, might put on enough strain to wreck the fence.

Clothes Line Reel

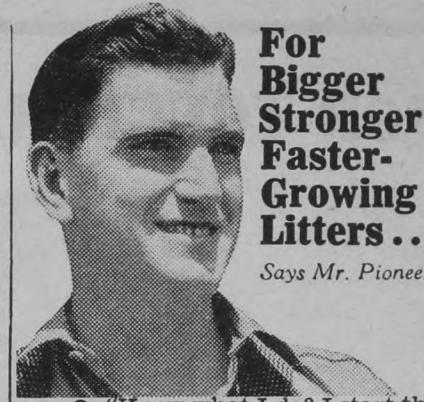
I had for some time been in need of a clothes reel and this is how I made



one. Many farmers use the rims of the rear wheels of a tractor for making water troughs. I have one on our farm. Making the reel gave me a use for the hub and spokes. I used four poles 14 feet long and some No. 9 gauge wire. I bent four spokes down through the poles and put a nut on the end of each spoke. I also placed a run of ball-bearings around the inner side of the axle, thus making the reel much easier to turn. For people with a large washing another wire can be added.—Art Thompson, Flaxcombe, Sask.

Driving Small Stakes

Small stakes that cannot be pushed into the ground and are too slim to stand pounding on the top without splintering can be driven with a hammer if this little contrivance is made. Simply notch a piece of hardwood as shown and anchor it to the stake with a piece of stout rope as indicated. It can then be driven into the ground as far as desired.



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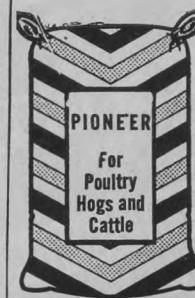
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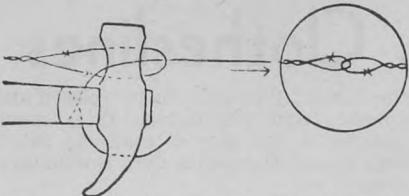
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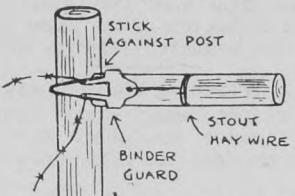
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Mending Break in Fence



This is the best way to mend a break in a wire fence, much better than using a wire stretcher. Connect on a new piece of wire to the broken strand and remove the barbs for a short piece. Fasten this to the claw hammer as shown and wind up until tight. Then pull against the loop strongly and wind the wire in the hammer around the strand.

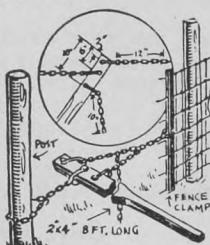
Wire Tightener



Here is a simple wire tightener which proves to be very handy around the farm. It consists simply of a bit of stick $2\frac{1}{2}$ inches in diameter and two feet long. An old binder guard is wired to the stick, about four inches from it. It costs nothing and often comes in very handy.

Fence Stretcher

A lever, four clevises that can be borrowed from the doubletrees, four bits of chain, two of them with hooks, and a clamp to be tightened on the fence with bolts, make up this stretcher. As you pull on one chain and take up some of the stretch of the fence you get a chance to catch the chain to the fence a few links further on with the other hook. The lever gives lots of power.



Staple Puller from Old Wrench



Only a few minutes time is necessary to convert an old monkey wrench into an efficient staple puller. The lower jaw of the wrench is removed and the upper jaw rounded on a grindstone or emery wheel. The sharp point is driven into the staple with a hammer as shown and a little pressure on the wrench handle starts the staple moving out of the post.

Gathering Barb Wire

Having to move some barb wire which had been used in a fence that ran through a long stretch of heavy willows, and needing it on another fence some distance away, I wondered how to move it. It would have meant a lot of work to clear a trail near the wire to roll it up and on account of the route I had to take I could not very well haul it to the new place with a team. So here is what I did and it worked just fine.

I took the tractor, one that has lugs on each side of the wheel, and after jacking one wheel up, I passed one end of the wire through the rim and then fastened it to a spoke. Then putting the motor in reverse gear I idled it very slowly and let the clutch in gently. The wire was soon wrapped around the wheel. My 15-30 will hold over 80 rods of regular gauge barb wire on each hind wheel.

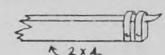
After winding the wire on the wheel I took the free end and ran it through a hole in the rim and then around another spoke. Putting the tractor in high

gear, after taking out the jack, I was soon where I wanted to use the wire on the new fence. Putting the end of the top wire around the corner post and securing it, all I had to do was to drive down beside the new fence and there was the wire all ready to put on.

On hard ground, when the wire is mostly all unwound off the wheel, the lugs make the circumference of the wheel greater than the circumference of the wire on the wheel and you must back up off the wire and unwrap one round of the wire or else it will break. Have someone stand on the loose wire till it tightens up some. This is the quickest and easiest way I have ever moved barbed wire.

For Removing Fence Posts

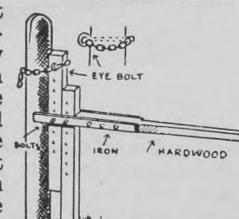
Please find enclosed a sketch of a post jack of my own construction which will help many farmers in the problem of pulling out posts which must be replaced by new ones or removed to another location. With this jack two men can pull out from 75 to 100 posts per hour. It is very simple to make and inexpensive. All it takes is a piece $2\frac{1}{4}$ by $8\frac{1}{2}$ feet long, two pieces $2\frac{1}{4}$ by 2 feet long, a piece of $1\frac{1}{4}$ for bracing, an old mower guard, a bolt $\frac{5}{8}$ -inches by $6\frac{1}{2}$ inches, two 6-inch clevises, two $1\frac{1}{2}$ -inch bolts 3 inches long, one 4-inch spike and a few $2\frac{1}{2}$ -inch nails.



The frame and lever are assembled as shown in the drawing. A hole for the large bolt is bored 18 inches from the working end of the lever. One man does the jacking by setting the jack the proper distance from the post and poking the end of the mower guard into the post about 24 inches above the ground and prying up the post while the other man pushes the post against the guard. With a little practice you will master the use of this jack.

Handpower Post Lifter

This jack will lift a post without the trouble of using horses. The two uprights have holes bored in them at intervals so that they can be adjusted for any height. Through the one next the post to be lifted there is an eye bolt. A short piece of chain goes round the upright, through the eye of the bolt and around the post. It is then a simple matter of lifting by pumping on the handle, getting a new catch with the chain every time the handle is lifted.

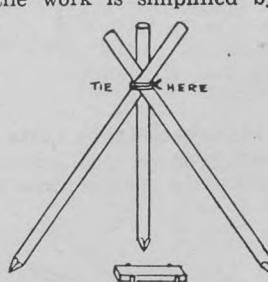
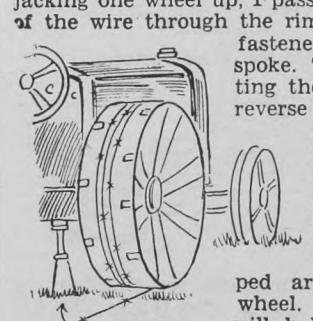


Another Clothes Line Tightener

There is no end to the methods of keeping a clothes line taut and this is as simple a way as any. Notches in the strip may be bored with an auger or whittled. In either raising or lowering the line to the next notch a broom handle is used as a lever. Place it between the line and the post and pull toward you. In lieu of a strip you can use spikes or hooks.

Tripod for Sharpening Posts

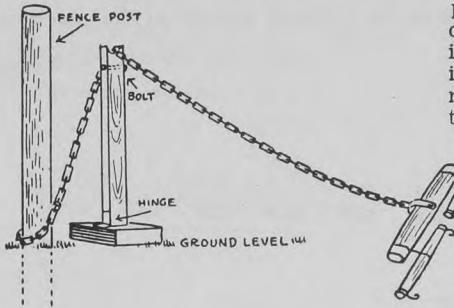
When it comes to sharpening fence posts the work is simplified by tying



three posts together so as to make a tripod. One end of the post to be sharpened is placed against the tripod and the other rests on a block which is held in position by four stakes. Then both hands are free to wield the axe.—Wm. Pikula, Amsterdam, Sask.

Post Puller

This post puller is made by taking a piece of heavy plank a foot square and a bit of hardwood about three feet long. The stick is fastened to the plank with a strong hinge. The stick is notched at the top and a bolt put through to keep it from splitting. Fasten the chain to the post just above the ground and pass it over the upright in the notch. Then



drive ahead.—Stewart A. Glauser, Delisle, Sask.

Adjustable Clothesline

A clothesline must be fairly low to hang the clothes on, but it often is a source of inconvenience when not in use. To make it adjustable in height it is fastened to two hardwood bars which slide up and down in U-shaped metal pieces. It is held up by an ordinary screw hook.—D. H. Edgeworth.

If you have any amount of wire then take a thick short piece of pole, hammer in a piece of bolt into the centre of each end for axles and nail a circle of tin on each end for a handy spool. This is best set up across a corner of the shop.

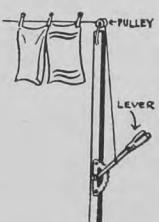
Clothesline Tightener

The clothesline has a disagreeable habit of sagging and it is quite a job to tighten it if some provision has not been made for doing it. In this case a tightener has been made from flat iron. The iron should be 3-16 inch thick and an inch wide. A bow is made to go over the end of the post. This carries the line. Another bow carries a rope for tightening and the two bows are braced as shown. The tightening rope is fastened around a small piece of wood nailed on the post.

Another way to tighten a clothesline is to sink a short post behind the clothesline post, down to the level of the earth. An eye bolt or screw is fastened to this hidden post and a stay wire, doubled, is strung from the eye bolt to the top of the clothesline post. When the line begins to sag the stay wires are given an extra twist as is done in tightening the brace wires of a corner fence post.

Non-sag Clothes Line

There are innumerable ways to keep a clothes line from sagging, and here is one of them. A lever from an old farm machine is used to apply the pressure. The end of the line is attached to it and then runs up over a pulley in the top of the post. Now, says someone, why didn't I think of that before?



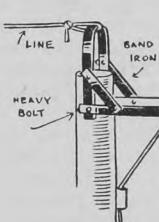
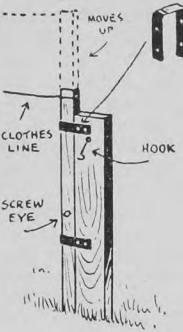
Car Crank Tightens Wire

An emergency fence wire tightener was made from an old auto crank of single piece construction. It proved so satisfactory that it is still being used for barbed and smooth wire in place of a

regular wire stretcher. To make it into the stretcher, a short pin was welded to the starting end as shown. The crank is then put up against the side of the post after the wire has been engaged under the pin and while the crank is held in place with one hand it is turned with the other, thus exerting easily a 15 to 1 leverage which is maintained as long as the crank is turned. Then the wire is stapled and the surplus unwound. The crank works as well also for taking slack out of a barbed-wire fence.—Dale Van Horn.

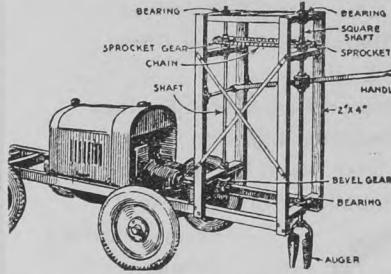
Clothesline from Window

There is a telephone pole about 30 yards from my kitchen window. I attached a pulley on the pole and another on the side of the kitchen wall opposite from the pole, and ran the line through the upper half of the kitchen window. I have the window fixed so that I can raise and lower it very easily, and also have a stop lock on it to keep it in place when closed. The clothes can be hung up in the kitchen and shoved out through the window.—N. Wynes, Kincaid, Sask.



Power Post Hole Digger

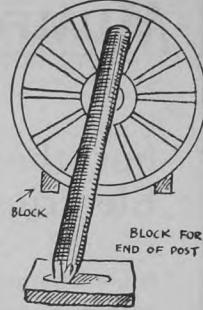
This power post hole digger can be rigged up from parts salvaged from discarded farm machinery. The bevel gears and top sprockets are from an old grain binder. Bearings in which the square shaft turns are of the type used on grain drills, or boxings and spools from a disc harrow can be used. The square shaft must extend out of the top bearing from three to four feet when the auger is in a raised position, the exact amount depending on the depth post holes desired.



The size of the frame work can be varied according to the material at hand. A power driven digger, such as this, is not only a handy thing to have around "the old homestead" but it offers the wide-awake farm mechanic a chance to construct a machine at low cost that has money-making possibilities. Any farmer who has 100 or more posts to set is a good prospect.

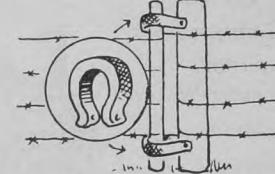
Holds Post While Sharpening

A simple way to hold a fence post while sharpening it is to hollow out a wooden block and lay it on the ground, beside a hind wheel of the wagon. You lay the post between two spokes of the wagon wheel with the lower end in the hollow of the block. Any size of a post will be held by this method while it is being sharpened.—Sam Phillips, Cabana, Sask.



For the Wire Gate

Instead of wire loops to fasten the free end of a wire gate sections of an



old auto casing can be used, according to directions in Popular Mechanics. These are said to be flexible, easier on the hands, and quite resistant to wear.



Limitation in output of new machines, owing to material requirements of the armament program and the scarcity of help, makes it vitally important for you to give your present machines every care and attention possible to keep them in good working order.

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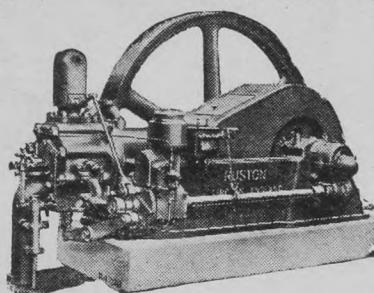
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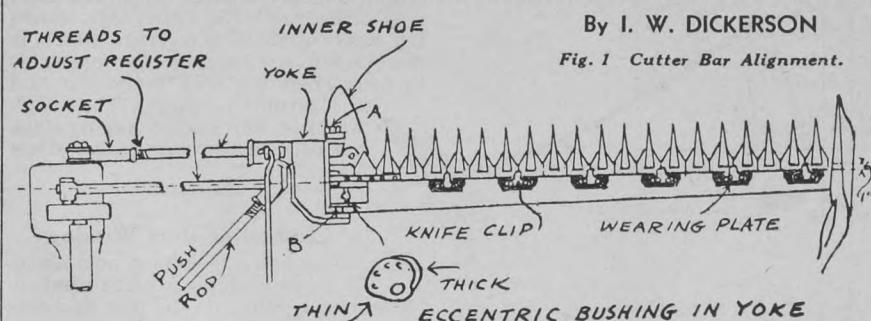
Field Implements and Heavy Equipment

Tuning Up the Old Mower

How to make repairs and adjustments to the business section of the machine

By I. W. DICKERSON

Fig. 1 Cutter Bar Alignment.



To check the alignment of the mower bar, support the front end of the tongue at its proper working height of 32 inches. Pull the outer end of the bar clear back as it would be in use. Tie a cord around a spoke of the left hand wheel from the outside, bring cord forward across the face of both wheels and along the cutter bar, and fasten beyond the outer shoe. Be sure the cord is the same distance from the floor at each end, and that it just touches the face of the right hand wheel. Measure the distance from the cord to the back edge of the knife at the knife head outside the inner shoe and at the

with a torch, then reamed until the pins can be inserted. New pins may be necessary if they are badly worn.

It is also vitally necessary that the knife "registers" properly, or stops at each end of its stroke with the middle of the section exactly in the middle of the guards. To adjust, first see that there is no undue play between the different parts. If the pitman is adjustable the register can be corrected in that way; if not, the whole cutter bar may be moved in or out by adjusting both the front drag bar and rear push bar. If neither of these adjustments is provided and the wear has been taken up in the yoke or hinge holes, the pitman should be lengthened or shortened as may be required. The register should be rechecked after each adjustment for alignment.

Tune Up the Cutter-Bar

The cutting action is very similar to that of a pair of scissors. The upper sketch in the diagram (Fig. 2) shows the right adjustments of the cutting parts to give clean cutting with light draft, while the lower one shows the wrong adjustments giving poor work and heavy draft.

For easy cutting, guard plates must have sharp bevel edges and those with rounded edges should be replaced. Plates with rivets are very cheap, and several should be kept on hand. To cut through the guard plate rivet head, grind a short shank on the end of a punch (A, Fig. 3), so that it is slightly smaller than the rivet and with the end square and hard. After starting, the rivet may be driven out with punch B, with a longer straight shank.

In replacing guard plate rivet, be sure the countersunk part of the hole has not been worn away on the under side of the guard. If so, it must be countersunk again with a rose countersink or with a larger drill bit, else the rivet will work loose. When new plates are riveted in place without removing the guard, insert the rivet from below,

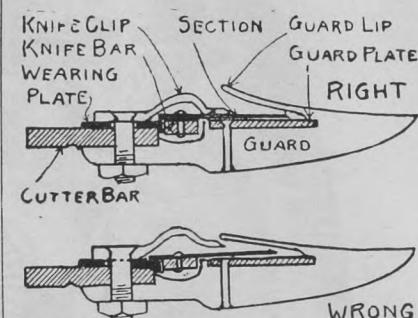


Fig. 2. Adjustment of Cutter Parts.

extreme outer end. The outer end of the back edge of the knife should be ahead of the inner end, about one-fourth inch for each foot of cutter bar length or about 1 1/4 inches for a five-foot mower, so that the cutting pull will bring the knife into a straight line.

This test also shows whether the cutter bar is at right angles with the crankshaft. A quicker test can be made by hooking the cord over the middle of the pitman head or socket and extending it across over the back of knife head and along the back edge of the knife, with the cutter bar pulled clear back. If the outer end of the knife back is 1 to 1 1/4 inches ahead of the cord (Fig. 1), the alignment is correct.

The loss of lead is usually due to wear at the front and rear of the yoke or inner shoe hinges. Some modern mowers take up this wear by means of an eccentric bushing on the back hinge pin as shown in the diagram. Turning this bushing will force the outer end of the cutter bar ahead and give the proper lead. Other mowers have adjustments on the front drag bar and rear push rod. By shortening the front bar and lengthening the rear one, the angle of the shoe will be changed and the outer end of bar moved forward. Adjusting only one bar will change the cutter bar angle with respect to the crankshaft, but not that of the pitman and knife.

Where an old mower with no adjustment for alignment has most of the wear on the hinge pins, replacing these may correct the alignment. Where there is the usual wear on both pins and yoke castings, both pins and castings should be replaced. If repairs are not available, the castings holes may be reamed and oversized pins used; or the outer end of the cutter bar brought clear forward and the holes in the casting built up on the proper sides

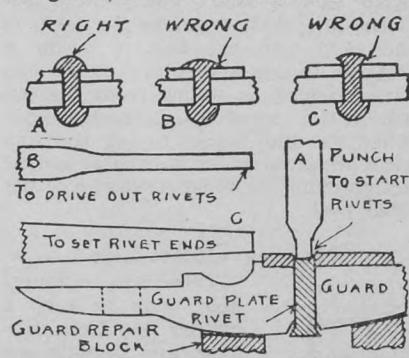


Fig. 3. Replacing Guard Plates.

set the riveting post of the repair block solidly under the rivet head, and swell the rivet end with a punch of about $\frac{3}{8}$ inch diameter (C). Then smooth the surface by cutting the rivet off flush with the guard plate with a cold chisel and set the rivet head with a punch. If the guard has been removed, the rivet should be inserted from the top, the guard turned upside down with the rivet head resting on the repair block riveting post or on a bolt held in a vise, and the other end headed with a ballpeen hammer. Do not rivet too tight or use the hammer directly on the guard plate, as it is very hard and cracks easily. Punches A and B should

be dressed frequently and preferably should not be used for other purposes.

The guards next must be lined up. If any are loose, tighten the guard bolt nut with a wrench while hammering on the head. Then lock the nut by setting a centre punch in the thread between nut and bolt and tapping lightly. Test with a new knife or one not badly worn to see that the guard plates are in line. Set any guard up or down as required by hammering on the thick part just ahead of the guard plate. Alignment of the guard points improves the appearance but is not essential. The guard wings also should be lined up, so as to give a smooth surface for the front edge of the knife bar to work against.

Wearing Plates and Knife Clips

The back edge of the sections are held up by the wearing plates so that the sections can lie flat on the guard plates. When the wearing plates become worn, the back of the knife drops down and the section points come up off the guard plates, and they should be replaced at a cost of only a few cents. The dropped front of the wearing plate also works against the back of the knife bar to hold it in place against the guard wings, any excess play being taken up by loosening the bolts and moving the wearing plates forward by means of the slotted holes.

The knife clips or holders reach over from behind and hold the front of the knife down against the guard plates, but must permit the knife to run without binding. When worn or bent up, hay is pulled between the sections and the guard plates and the mower will choke down. Pull back the knife and tap the knife clips lightly to bring it down closer, then try the knife again, and repeat until the knife lies snugly on the guard plate but still works freely. Start with the outer clip and adjust each clip separately. If a clip is driven down too tight, raise it slightly by prying on the outer end. If the knife does not work freely by hand, some clip is too tight or some wearing plate bears too hard against the knife bar.

The Knife

Knife sections must be kept sharp to do good work with light draft. Be careful to run the grinder from the cutting edge toward the knife, as this causes less heating. Use light pressure and keep the edge moving to prevent heating and softening the edge. Grind into the corners and check with a new section to see that bevel and slope are correct.

Knife sections should be replaced when they are cracked, broken, or ground down to a point. Old sections are best removed by slipping them, point down, between the jaws of an iron vise with the knife bar resting on the jaw, then striking the back of the section over each rivet a sharp blow with a hammer. Driving out the rivets with a punch enlarges the rivet holes and weakens the knife bar.

The best way to rivet new sections to the knife bar is to use a fairly heavy hammer and a rivet set, which costs only a few cents and should be in every shop. However, good riveting can be done with a ballpeen hammer. The rivet must be left high in the centre with the edges down tight against the section. The diagram (Fig. 3.) shows right and wrong shapes for finished rivets.

Repairing the Mower Chassis

Most mower wheels are held on the axle by washers with notches of varying depth, for taking up axle and play. If these are not enough, hinged quick-repair washers may be snapped around the shaft, or washers may be cut from sheet metal. Where the wheel hubs are so badly worn as to give excessive wobble, it may be advisable to ream them out with a flat file fastened to a stick and turned with a wrench, so that a bushing of thin metal can be slipped between hub and shaft. The dogs or pawls and ratchets in the main wheels should be cleaned and replaced if badly worn, and the dog springs replaced or the tension increased if they are weak. Otherwise they are likely to slip and wear badly on rough ground.

The small bevel gear at the rear end of the crank or flywheel shaft may need replacing. This gear usually screws on to the shaft so that the driving pres-

sure tends to turn it on tighter. Determine which way it is driven by the large gear, then set a punch between the cogs at the large end and drive the gear backwards while the flywheel is held solid.

If the crankshaft has any perceptible side play in the bushings, replace them after removing the crankshaft and flywheel. First see that there are no set-screws holding them. The top or rear bushing is short and usually can be driven out easily with a 3 or 4-foot piece of pipe or shafting slipped through the front bushing (Fig. 4).

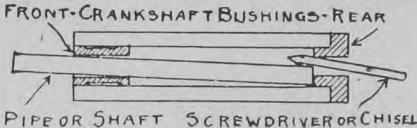


Fig. 4. Removing bushing with piece of pipe

Sometimes it may be necessary to split the end of the pipe or shafting with a hacksaw, and then spread it with a screwdriver (Fig. 5) so as to bear squarely on the end of the bushing. If this does not loosen it or if the bushing is worn thin, it can be sawn in one or more places with a hacksaw blade (Fig. 6), or a nail-cutting compass saw, and then pried out. The front

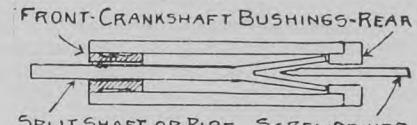


Fig. 5. Pipe may be split and spread.

or lower bushing is long and pressed tightly into place, but usually can be removed without much trouble after the rear one is out of the way. Sometimes it can be started with a pipe or shaft of nearly the same outside diameter slipped through from the rear,

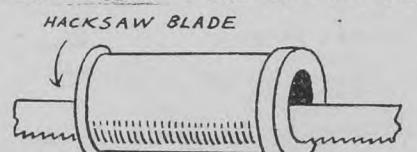


Fig. 6. Splitting bushing with hack saw.

or it may be pulled from the front with a bolt, a washer or two, and a piece of pipe (Fig. 7). Usually, however, the easiest way will be to split the bushing with a hacksaw blade.

Before driving in the new bushings, check the outside diameter and the fit on the shaft, then put a pipe or shaft in the crankshaft hole to guide the bushing straight, and use the old bushing or a piece of larger pipe back of the



Fig. 7. Pulling bushing with bolt.

new bushing (Fig. 8) to give a square driving effect and to prevent battering. The bolt, washer, and nut method (Fig. 7) can also be used with the bolt long enough to extend clear through the crankshaft hole.

Usually the crank pin, which drives the pitman, will be worn oval and should be replaced. Do not remove the flywheel from the shaft, but grind off the riveted end of the pin, place the

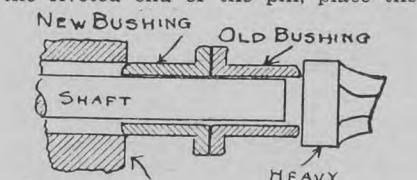


Fig. 8. Driving on new bushing.

flywheel on a solid block with the pin extending down through a hole, and drive the pin out with a heavy punch and heavy hammer. In driving in the new pin, screw on two nuts to protect the threads or use a short piece of pipe which will just slip over the threads. Protect the threads in the same way while riveting the pin in place.

After replacing the crankshaft in its renewed bushings, it should be adjusted

with washers so that the pinion at the rear meets the large bevel gear properly and to have between 1/64 and 1/32-inch endplay. Proper mesh of the large gear with the small pinion can then be made by end adjustment of the short cross or counter shaft, and this should be enough to give a slight click when the gears are rocked back and forth.

Harrow Marker

During dusty days it is difficult to see the harrow mark. This marker overcomes the difficulty. Take a piece of strong strap iron and fasten to the first two teeth from the outside on the back row so that it projects about 18 inches clear of the harrow. Drill a 1/4-inch hole in the end to take the wire. To the end of the wire fasten a brake drum from an old model T. The drum does not dig in and enough dirt comes up through the hole to give it sufficient weight to leave a broad mark. The mark left makes a path for the outside horse to walk in on the way back.—M. H. Schab, Calder, Sask.

the wire fasten a brake drum from an old model T. The drum does not dig in and enough dirt comes up through the hole to give it sufficient weight to leave a broad mark. The mark left makes a path for the outside horse to walk in on the way back.—M. H. Schab, Calder, Sask.

Extra Hook on Packers

An extra hook of light steel 1/8-inch by 1/2-inch, shaped as shown in the diagram and riveted on the packers of a binder make a wonderful difference in the way the binder will handle crops that are weedy, especially with Russian thistle. Every farmer who has handled a binder

among weeds knows that trouble is caused by the packers failing to bring the grain down to the knotter. This device will help solve the trouble.

Improving the Pull

Usually the horses used on the plow or other implement are unequal pullers. Most doubletrees are so placed that one team can slacken and force the other to do most of the pulling. With this pair of clevises they can't let the end of the doubletree rest against the edge of the evener. Mine are made of 2-inch by 3/16-inch flat iron. In each clevis two pieces of such iron are 13 inches long, bent in a blacksmith shop to the shape shown. The middle piece is 11 inches long. The doubletree thereby is made to swing above the evener and each team has to take its full share of the load.—Mike H. Schab, Calder, Sask.

Contour Leveller

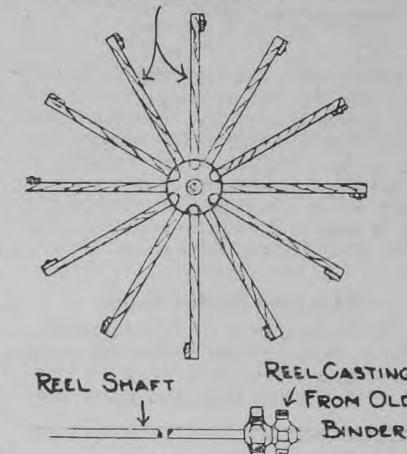
Two months ago reference was made in The Guide to an attachment placed on tractors when plowing contour furrows along hillsides to prevent runoff. By means of it a tractor can be kept running on the level. Here is one variation of the device. A front auto wheel and stub axle with a weight at the bottom and a scale to show how it swings is mounted on front of the tractor as shown. It works on the principle of a plumb bob and shows the operator instantly whether the front end of the tractor is level or is going up or down hill. It is so sensitive that on a tractor equipped with it a good operator on a contour line will vary less than half an inch per 100 feet. It can also be arranged for horse drawn equipment.—I.W.D.

This sled affair is hauled by four horses. Before loading, lay a pole across in front with a chain fastened on each end. Then load up the sled with sheaves or hay as the case may be. On reaching the stack or the machine, drive a couple of crowbars into the ground sloping backwards, and fasten one of the chains to each. One person holds each crowbar. Then drive the horses ahead and the sled slips out from under the load quite easily. This beats everything I ever tried when it comes to saving labor in hauling in grain or hay. It doesn't matter how rough the ground is.—T. G. Lanegraff, Dorintosh, Sask.

Extra Reel Slats for Down Grain

Here is an ingenious arrangement worked out by Chris. Faust, Pierz, Minn., for picking up down and tangled grain. It works much better than to increase the speed of the reel, as it is

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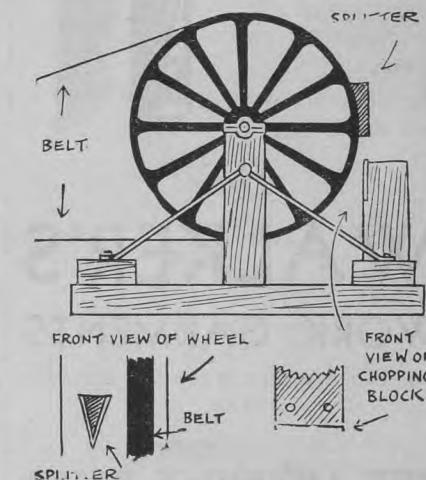


not so likely to knock the grain back off the platform if the wind is strong.

Slip an extra set of castings from an old binder on the reel shaft and lock them so that the extra set of reel slats will be spaced equally between the regular slats. With this arrangement, twice as many slats will lift the grain back against the sickle and the weight on each slat will be correspondingly decreased.—I.W.D.

Wood Splitter

This is the wood splitter that J. H. Cooper, of Neelin, Man., rigged up. He got a pulley from an elevator. It has a 12 inch face. To the rim on one side is riveted a wedge, faced with two leaves of an old auto spring, brought to a sharp edge in front. The splitting block is made as shown, with a notched iron plate. The belt from a 3 1/2 h.p. engine runs on the other side of the wheel. The stick of wood is held on its side and



pushed in so that the wedge shaped splitter comes down on it. If the splitter sticks, it simply throws the belt and no harm is done. As fast as a man can feed the blocks to the machine, it will split them.

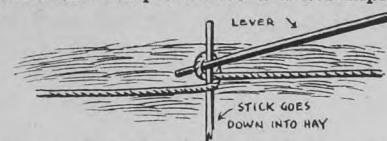
Sled for Hauling Grain

I have a labor saver for stacking and for hauling sheaves to the machine that saves a lot of work. First I put down two skids, three feet apart and from 12 to 14 feet long. On them I bolt five cross pieces and on top of these, running from front to rear, I spike or bolt straight, slim spruce poles, about six inches apart. A frame is erected at the front only.

This sled affair is hauled by four horses. Before loading, lay a pole across in front with a chain fastened on each end. Then load up the sled with sheaves or hay as the case may be. On reaching the stack or the machine, drive a couple of crowbars into the ground sloping backwards, and fasten one of the chains to each. One person holds each crowbar. Then drive the horses ahead and the sled slips out from under the load quite easily. This beats everything I ever tried when it comes to saving labor in hauling in grain or hay. It doesn't matter how rough the ground is.—T. G. Lanegraff, Dorintosh, Sask.

Binding a Load of Hay

In binding a load of hay a long pole can be roped over the top from front to back but when such a pole is not at hand this simple device will accomplish



the same result. A 4-foot stick is pushed down into the hay in the middle of the load. A rope is stretched from the front standard to the rear of the wagon. The rope is then tightened by twisting it around the stake by means of a stick as shown. After the rope is tightened the stick is tied to it to prevent untwisting. —Mrs. Dan Harris, Edgeworth, Sask.

Repairing Binder Roller

A satisfactory way for the temporary repair of binder rollers where the straps have worn a groove, is to wrap the worn part with friction tape and paint over

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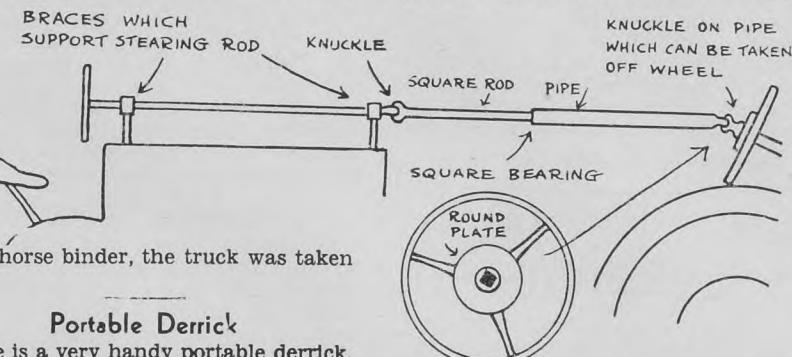
the tape with shellac. Plastic wood can also be used for filling in the worn part. A permanent repair can be made by wrapping a piece of tin around the worn place and fastening tightly with twisted wires, with an open place at the top through which melted lead or babbitt can be poured. When cool, the tin can be removed and the lead or babbitt smoothed off with a file or scraper. The lead can be melted in an old skillet, granite stew pan, or any unsoldered container except aluminum. —I. W. Dickerson.

Steering Tractor from Binder

In the April issue, The Guide published an illustration showing A. J. Hiscock, of Lenswood, Man., driving his tractor from the seat of the binder. Mr. Hiscock was asked to give the details of construction and here they are, including a diagrammatic sketch:

Where the square rod engages a piece of pipe, there is a square bearing through which the rod will slip when turning corners. The inserted diagram shows how a round piece of flat iron is shaped to fit the steering wheel of the tractor so that it can be put on with clamps. A square piece of rod is fixed to the centre of the plate and it fits into the square hole of the knuckle. A cotter pin is used to hold it in place so that the pipe is easily detached from the tractor.

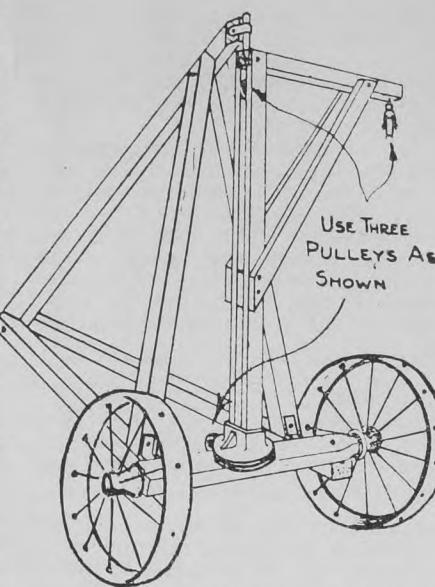
To work the clutch from the binder seat a rope is used. An extension is put on the foot clutch arm, the rope is attached to it and run through a pulley at the front of the tractor and then back to the binder seat. As Mr. Hiscock



has a horse binder, the truck was taken off.

Portable Derrick

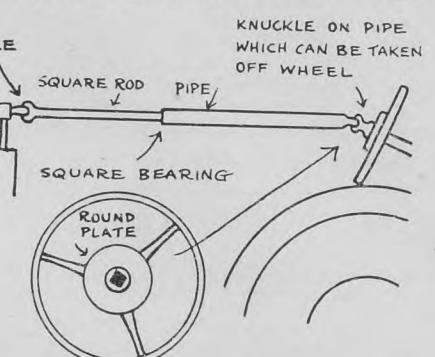
Here is a very handy portable derrick, for loading rocks, butchering hogs and cattle, digging pits, and many jobs around the farm. The axle and wheels are from an old threshing separator, but a heavy auto axle could be used by turning the drive shaft tube straight up, putting a pipe or shaft in the tube to serve as the turning post, and clamping a heavy wood frame to the axle with diagonal support for the anchor part. The boom brace could be fastened loosely at the bottom with a band around the drive shaft tube. The bolster socket serves as a pivot for the bottom of the swinging post, while a stub shaft and a piece of strap iron makes a bearing at the top. A pulley is attached to the outer end of the boom or swinging arm, a second is put between the members of the upright post at the top, and a third one is fastened close to the axle at the bottom. The location as shown is intended for the pull to be on the side away from the weight to be lifted, but the pull can be from any desired direc-



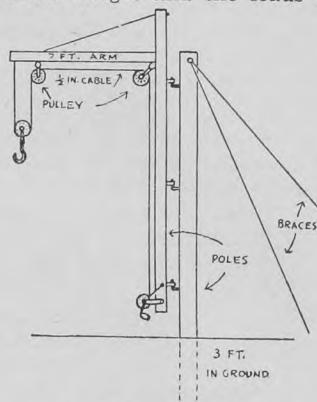
tion by properly locating the lower pulley. The upright is about ten feet high, and the boom or arm is 12 feet long. Loads up to 1,000 pounds can be lifted easily, swung to either side, and then let down. —I. W. Dickerson.

General-Purpose Derrick

This derrick is handy for butchering pigs and for lifting oil barrels, racks and wagon boxes. A good stout post is set three feet into the ground and braced with wire. The arm, which is seven feet long, is morticed into the upright and also braced with wire. A half-



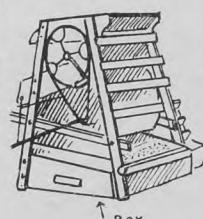
inch cable is used. The upright is swung on three hinges and the loads can be



swung around to either side out of the way. —Jack Shier, Chinook, Alta.

Drawer for Fanning Mill

To prevent wastage of grain or scattering of seeds under the fanning mill I made a drawer to put under it. In size and shape it fits exactly under the machine. Nail two small runners on the bottom for easy sliding on the floor or ground. Attach two handles to the drawer so that when it is drawn out from under the mill it can be lifted and the contents dumped in a pile. This makes a fanning mill look more like a complete machine, besides the convenience it makes. I made and use one and it gives satisfactory service. —M. Pilichowski, Rama, Sask.



Hand Weed Burner

To make this burner, take a piece of inch piping five feet long. Pull a piece of rolled rag into one end, using a bit of wire, until the rag is about ten inches into the piping. From the other end fill the pipe with kerosene or distillate and

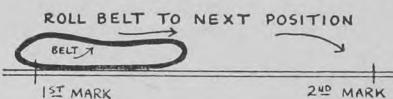
plug with a tight cork. The rag acts as a wick and it will not blow out in the



highest wind. It will continue to burn until it is put out or the fuel is exhausted. —Peter Tschetter, Granum,

Measuring Belt

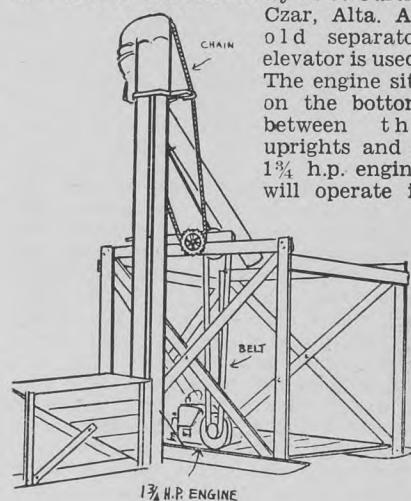
This is an accurate way to determine the exact length of an endless belt. Place the belt on the floor or any smooth



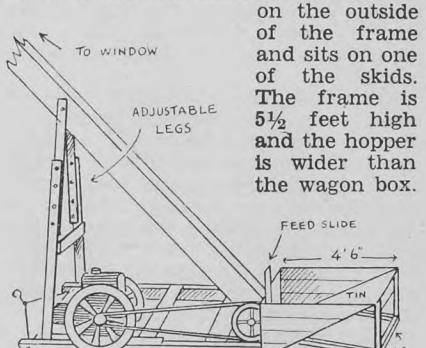
surface. Then mark both the belt and the floor as shown. Then roll the belt along the floor until the mark on the belt again touches the floor. The distance between these two points on the floor will be the length of the belt. —A. Baumann, Verlo, Sask.

Two Grain Elevators

The first design of a farm elevator shown here was sent in by L. J. Curtis, Czar, Alta. An old separator elevator is used. The engine sits on the bottom between the uprights and a 1 1/4 h.p. engine will operate it



easily. The mounting is on skids with steel shoeing. The hopper is removable and an arm can be provided to lay the elevator down on when necessary in moving, as the elevator swings down just as it does on the separator. The skids are eight feet long and the frame is 3 1/2 feet wide. The elevator is

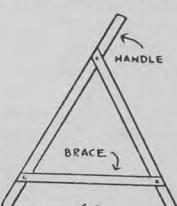


on the outside of the frame and sits on one of the skids. The frame is 5 1/2 feet high and the hopper is wider than the wagon box. The second elevator illustrated was constructed by Donald McIntyre of Primate, Sask. It is also made from an old separator elevator and is powered with a 1 1/2 h.p. engine. The hopper is made separately and can be lifted out of the way when driving in with a load of grain. The whole outfit can be hitched behind a wagon for moving. The hopper is 4 1/2 feet long and 2 1/2 feet wide and just high enough to suit the wagon.

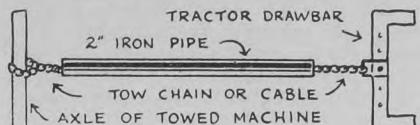
For Measuring Land

Take three strips of wood and nail them together as shown in the diagram. One strip projects at the top to form a handle and the two uprights are each brought to a dull point at the bottom.

A convenient distance between points is six feet but some might prefer them to be half a rod or 8 feet 3 inches. In using this measuring device the ends are swung around alternately. Be sure to travel in a straight line and when measuring soft ground it is necessary to guard against slippage. —F.A.A. Celista, B.C.

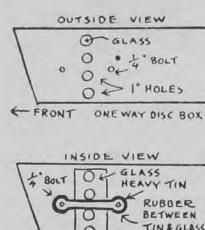


Handy Towing Device



In towing a car or heavy machine from a tractor or truck, the plan of running the tow chain or cable through an iron pipe, six to eight feet long, will admit of either pushing or pulling and will prevent the towed machine from running into the tractor on a down grade.—I.W.D.

Watch the Grain



It is a great help to be able to see the level of the grain in the drill from the tractor seat. Drill four one-inch holes in the seeder box in a convenient place for the tractor driver to see. Place a glass on the inside of the box and hold it in place with tin and two 1/4-inch bolts. Place a piece of inner tube under the tin and over the glass to protect the glass from jar.

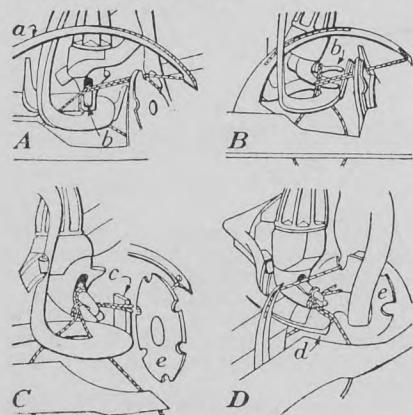
—Avery McConnell, Box 43, Wiseton, Sask.

Repairing D.D. Drill

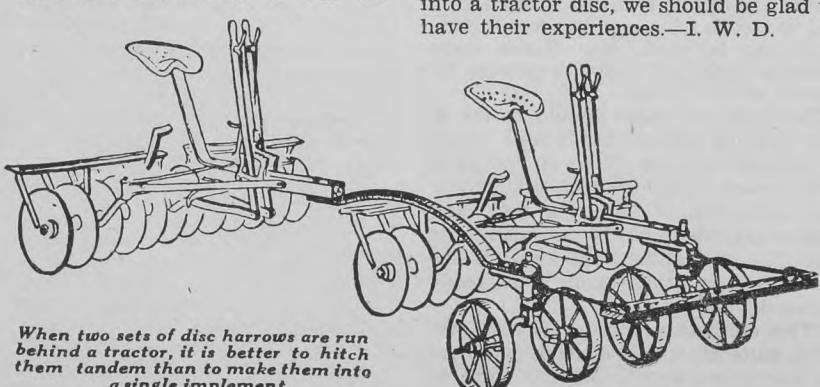
When the plates wear down on double disc seed drills they get loose and the seed doesn't get down to the moisture. They can be made tight as when new by taking the plates off and bending them with a heavy hand hammer saucer-shaped. They are laid flat on top of a solid ring or even an old disc-harrow blade and hit sharp blows. They will bend one-quarter or three-eighths inch without kinking the blade. I consider this the cheapest, slickest repair trick ever put on a farm implement and worth up in the hundreds, but being Scotch and neighborly you can pass it on.—John Black, Oyen, Alta.

How a Knot is Tied

In order to know how to correct tying troubles in binder knotters it is essential to know just how the knot is tied. This illustration explains the operation.



When the needle (a) advances, as at A, it puts the twine over the knotter bills and into the disc. The latter turns sufficiently to hold the twine securely. With the needle still advanced, the bills revolve, forming a loop in the twine. As one revolution is nearly completed, the bills (b) open to grasp the needle ends of the twine, as at B. The ends are held tightly as the bills close. Then the knife (c) advances sufficiently to cut the



When two sets of disc harrows are run behind a tractor, it is better to hitch them tandem than to make them into a single implement.

twine, as shown at C. The needle then recedes and the stripper arm (d) advances and strips the loop off the bills, thus tying the knot, as at D. The twine for the next bundle is placed in the notch of the disc (e). The diagram shows the knotter mechanism of a standard make of binder.

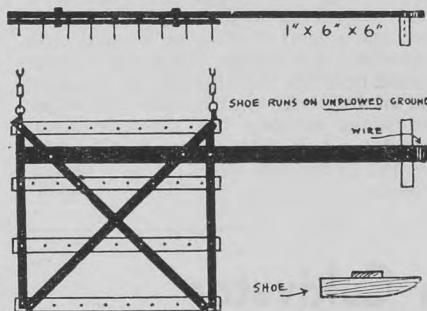
Test Your Twine

In your last issue in regard to the operation of a grain binder and particularly the tying end of the machine I would say that the first thing an operator should do is to test the strength of the twine, as no twine testing less than 90 pounds can be expected to tie without a good deal of breakage. I may add that a lot of the twine sold last year by official test was only 58 pounds for 550 foot and 64 1/2 pounds for 600 foot twine, so you see no knotter can be adjusted to tie or handle that kind of twine. Only one make would tie us a sheaf that we regarded as tight enough. So you see the first thing you should have done before telling how to make adjustments was to advise farmers to test their twine, otherwise the advice re adjustments would only confuse.

I tested my twine by suspending two bundles of 100 pounds on a piece of twine and only one brand would stand this test. So add to your article the advice to first test the twine.—E. B. Dobson, Moosomin, Sask.

Harrow After Plow

To pulverize and pack after a two-furrow tractor plow a section of harrow was hitched behind the plow with light chains. But no matter how we adjusted the chains the harrow would persist in riding into the furrow. An extension beam across the plow was tried, but



this put too much side drag on the plow. Finally an arm made from 1x6 and six feet long was bolted across the harrow about one-third from the front and to this a wooden shoe 15 inches long and made of 2x6 and securely nailed on. The shoe should be soled with a piece of strip steel to give best results. The harrow runs behind the plow with the shoe on the stubble and keeps the harrow level. The results of this gadget were really wonderful.—W. G. Galway, Rolling Hills, Coalhurst, Alta.

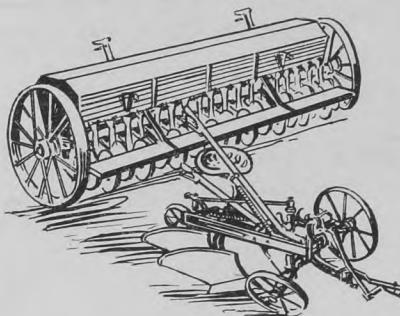
Two Discs Behind Tractor

It is possible to rebuild two horse-drawn discs into a single one for tractor use, but usually it will not pay to make the change. Neither the frame, the bearings, nor the lever mechanism are heavy enough to stand up very long under tractor use; and it will cost a considerable sum for new parts and shop labor to rebuild them so they will give satisfactory service. It will be better to hitch them behind the tractor to make approximately a 14-foot width as shown, and wear them out in this way. If any of our readers have worked out a practical method for rebuilding them into a tractor disc, we should be glad to have their experiences.—I. W. D.

21
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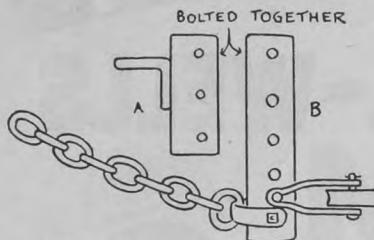
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Hitch for Drill

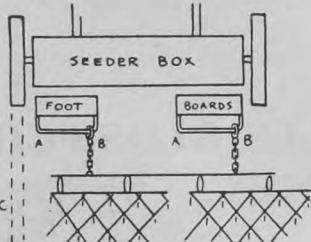
This device proved very helpful to me in reducing the weight of the seed drill pole. By bolting a strong piece of I-beam to the original drill hitch, and thus lowering the line of the draft I eliminated the usual trouble of sore



necks on the pole horses and increased my daily acreage drilled. A bolt is put in the top hole of the original hitch A, and through the top hole of the I-beam B. I use a chain to hold the new hitch in place because it is easier to adjust frame back near the axle. I lowered the line of draft until there was no weight on the poles when the horses were pulling.—Walter Watson, Hayter, Alta.

Harrow after Drill

At A are two pieces of round iron bolted under the foot boards of the



seeder. A plow ring is slipped on each one before it is fastened. To each plow ring a short piece of chain is attached as at B and fastened to the harrows. When the turn is made each time the rings slip along the irons. If the harrows are as wide as the drill the land will be completely covered and at the same time the rings automatically slip over at each turn so as not to cover the wheel track.—H. C. Pinnegar, Langdon, Alberta.

Raking Hay Behind the Tractor

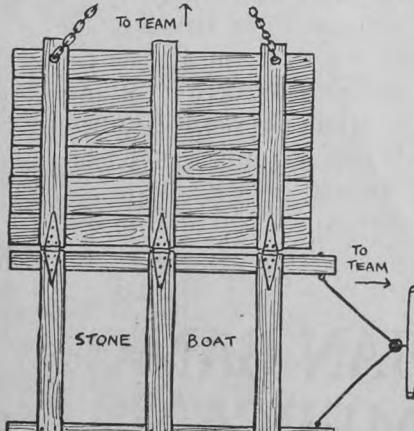
To adapt the old hay rake to use behind the tractor or light farm truck, the first and only thing necessary is to remove the wood tongue and replace it with a short one made from a pipe or channel iron.



The pipe shown is only five feet long, $2\frac{1}{2}$ inches in diameter, and permits short turning. It should be flattened at no point along its length since greater strength comes if it is left round. Merely drill holes where necessary, then drill a large hole in the front end for the tractor connection.—Dale Van Horn.

Manure Boat

This device has saved a lot of labor for me. The floor is constructed and hinged to the frame work of the sled as shown. The chain, only parts of



which are shown, is attached to a singletree. When the boat is loaded the chain and single tree are thrown over

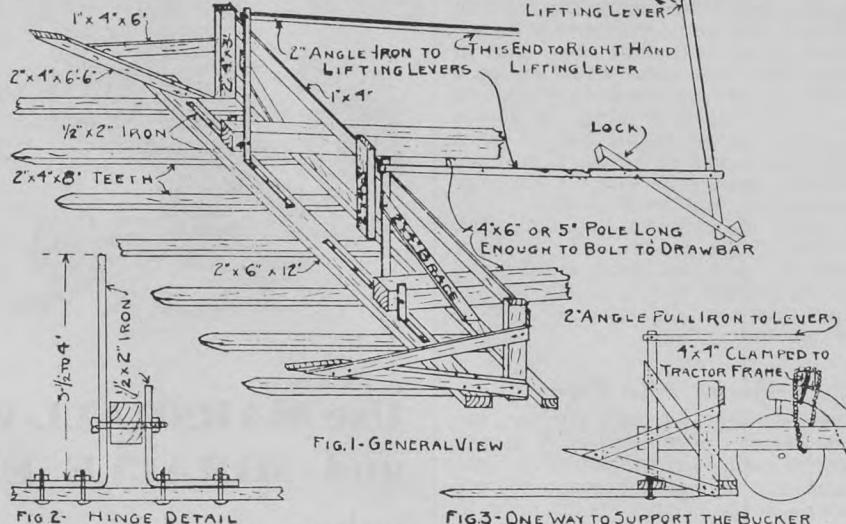
Power Hay Bucker

The bucker has eight 2x4 tines or teeth eight feet long, which are bolted or 20 inches apart to a 12-foot 2x4 at the rear, and to a 12-foot 2x6 about two feet from the rear ends. To this 2x6, about three feet from each end, are fastened two $\frac{1}{2}$ x2-inch iron uprights, five inches apart in such a way that they can be bolted to the front ends of two 5-inch timbers to form hinges (Fig. 2) to carry the bucker and permit some slight tilting of the teeth. These timbers are about six feet apart at the hinges, pass along each side of the tractor through a saddle clamped to the front of the tractor frame (Fig. 3), and are bolted to the middle of the tractor drawbar. Let one of the iron uprights at each hinge stick up $3\frac{1}{2}$ to 4 feet, and brace

each upright with a 2x4 extending back to the 2x4 by 12-foot cross sill.

The method of raising and lowering the bucker teeth will depend on the model of tractor used, and the material at hand. Some use a 2-inch angle iron extending from the top of the $\frac{1}{2}$ by 2-inch iron upright back to a lifting lever, one on each side. If only one lifting lever is used, the pull irons may be connected to a cross bar to equalize the pull on the two sides.

The bucker should be supported as nearly over the front wheels as possible. Mine is hung by chains from a heavy saddle clamped across the frame just in front of the radiator. On other tractors, the timbers can be hung from the heavy pipes or bars which support the cultivating equipment. —I. W. Dickerson.



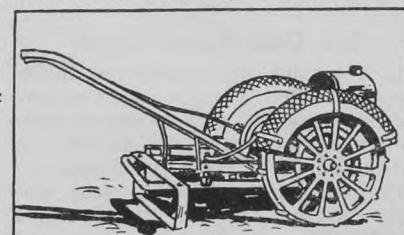
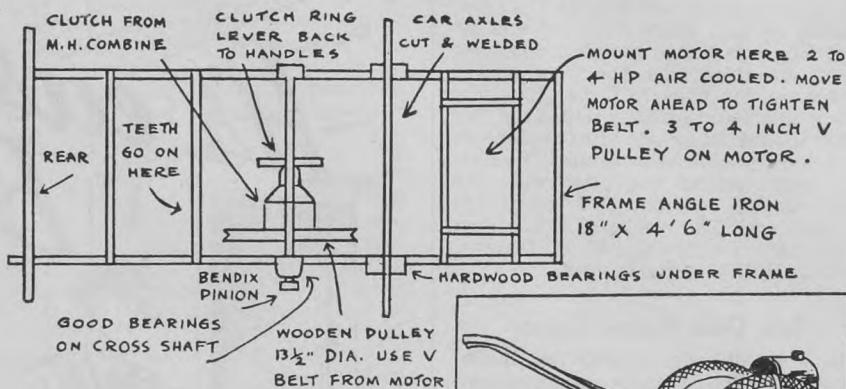
the load. To unload, the horse is unhitched from the singletree in front of the boat and hitched on to the other one. With a light pull the load is dumped.—Leslie Allan, Neville, Sask.

Cleaning Thresher

Make a tube 16 feet long out of sacks, one end just large enough to tie on the

end of the blower and the other end about six inches in diameter. The small end has a loop of wire or a small rod extended for a handle. Turn the blower around over the thresher, tie on the large end of the tube and handle the other end so as to blow the thresher clean outside and in. This is the best by test method I ever saw.—T. K. Kelsey, Gunn, Alberta.

Power Garden Cultivator



In the February issue The Guide referred to a power garden cultivator constructed by R. A. Johnson, of Beadle, Sask. So many requests came to Mr. Johnson and The Guide for a detailed description of the cultivator that further information was supplied by Mr. Johnson. He says:

"It is not hard to build, with the help of a local blacksmith. Some welding and lathe work is needed. The chief difficulty at present is to get a suitable engine. We are using a Wisconsin air-cooled 2 to 4 h.p., depending on speed.

"The drive is taken by a V-belt from a 3 to 4-inch pulley on the engine to a $13\frac{1}{2}$ -inch wooden pulley mounted on a counter shaft, along with the clutch from an old style Massey-Harris combine with the low grain tank. The lever from the clutch goes back over the handles to reach the operator.

"The counter shaft should be about an inch in diameter in good bearings. On the right-hand end, looking from the rear, is spot welded a Bendix starter pinion which is meshed with two ring gears from a model T Ford. These are mounted on the right-hand wheel, either by bolting to the spokes, or better still a steel plate is bolted to the hub where the brake drum goes.

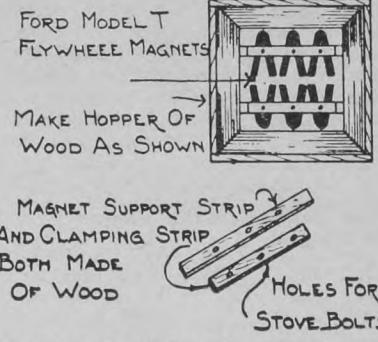
"I am using model T wheels with lug welded to the rims, and Ford axles cut and welded. Wooden bearings are all right on the main axle. No differential is needed; good long handles made from piping give the leverage to turn it easily. The frame is made of angle iron and the teeth from a spring tooth cultivator can be used; also blades made from car springs. I prefer the blades for getting all the weeds.

The teeth or blades should be set so they will cut outside the wheels. Made to cultivate a strip 22 to 30 inches is wide enough to handle and to cultivate. The mounting of the ring gear and starter pinion must be accurate and true. The only thing that wears is the small Bendix pinion and it is easily replaced.

"This cultivator is by no means a toy but is quite practical. We have had ours for four years and would not want to garden without it."

Magnetic Grinder Sieve

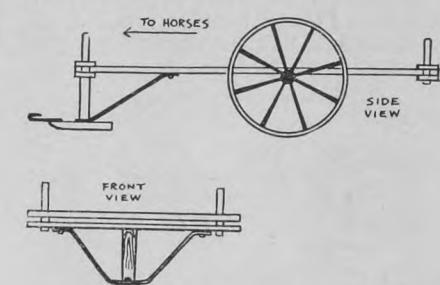
The diagram shows how to use six to eight magnets from an old Ford magneto to make a magnetic sieve for a burr-type feed grinder. The magnets are clamped between two strips of wood as shown and these are then bolted or



screwed to the under side of the hopper. They are close enough to keep large stones or pieces of iron from going through, and the magnetism in the poles is strong enough to attract and hold smaller pieces of iron or steel. It is not necessary to clean out what is caught until you are through grinding. On each strip the north pole of each magnet should be put next to the south pole of the other, then the two sets arranged so the north pole of one magnet will be directly opposite the south pole of the other. In other words, poles which attract each other should be put as close together as possible.—I.W.D.

A Handy Cart

The running gear is composed of the axle and wheels of an old mower. A flat bottom, 10-feet long and just wide enough to fit inside the wheels, is made of two-inch planks with two 2x6's spiked across each end and projecting five inches past each side. Two-inch holes bored through both cross-pieces will hold stakes firmly in place. The shaft is clamped to the two outer planks six feet from the front end. A heavy bolster brace from an old sleigh is bolted beneath the front end; and another flat iron strip about three feet long is placed at right angles to the brace to take the draft and bolted to the centre of the flat bottom.

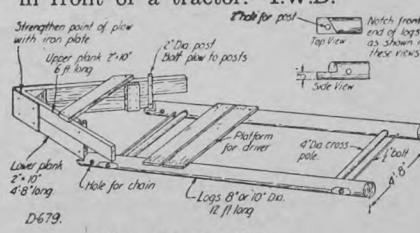


A 3x6 wooden runner, $1\frac{1}{2}$ feet long and shod with the mower shoe, is bolted to the centre of the sleigh brace and the end of the iron strip with a 1-inch bolt. When a strong hook is attached to the front end of the runner the cart is ready for use with one or two horses.

We have used this cart to haul manure, garden produce, stones, and sometimes hay, and all odd jobs. When empty it can easily be drawn by hand and can be turned in its own length.

Snow Plow

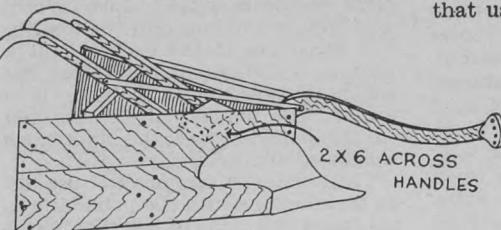
This snow plow is made to be drawn by horses and can be made from logs and pieces of planking, with a few accessories. Full directions are given in the sketch and it is needless to repeat them. As good sized logs are used the implement has considerable weight. Note that the point in front is strengthened with a piece of iron plate, and that there is a platform for the driver. The runner part is 4 feet 8 inches wide. The design could be modified to push in front of a tractor.—I.W.D.



D679. HOME MADE SNOW PLOW

Snow Plow or Ditcher

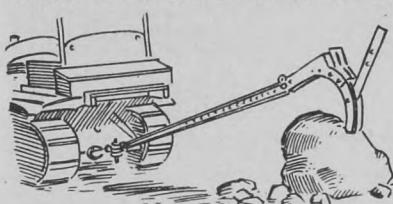
There are quite a number of walking plows scattered around the country. Even on the open prairie a few superannuated breaking plows are left. This shows how a walking plow can be rigged



up to make a snow plow or a shallow ditcher. On the level prairie a very shallow ditch will frequently drain the water away from buildings in wet seasons and avoid the accumulation of mud. A furrow soon fills in, but a wide shallow ditch will continue to function for a long time.

Stone Puller from Plow Beam

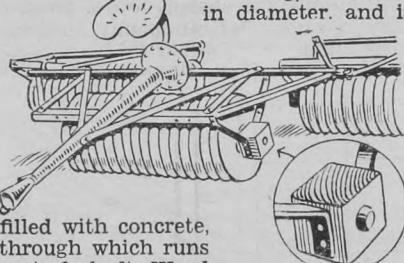
Mr. E. J. Stansfield, Atwater, Sask., has furnished The Guide with a snapshot of a stone puller taken on his farm from which this drawing has been made. It is an old idea to him, but may be new to many. It is made from an old P and O plow beam and the assembly is left just as it was on the



plow after the share, mouldboard and frog are removed. The clevis is arranged so that the rock puller remains vertical. The puller is strong enough to take all you can give it, but a man can handle it. It can be attached to any tractor. Mr. Stansfield never tried it with horses, but he knows some men who have used it successfully with them.

Land Roller from Steel Culvert

This unusual farm land roller has proved unusually efficient. Made in three sections of ordinary steel, corrugated culvert, they are mounted to an old seeder frame. Each roller is five feet long, 20 inches in diameter, and is

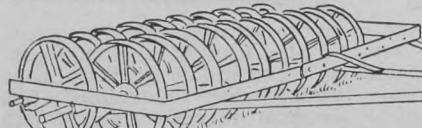


filled with concrete, through which runs a steel shaft. Wood blocks, well oiled, form end bearings and to prevent these from rubbing against the ends of the concrete, old discs are placed between the concrete and blocks.

The tongue is the torque tube from an old car, bolted in place. The seat, once on a mower, is bolted to the axle housing end, a large iron ring provided in the other for attaching to the tractor or behind a team.—Dale Van Horn.

Packer after One-Way

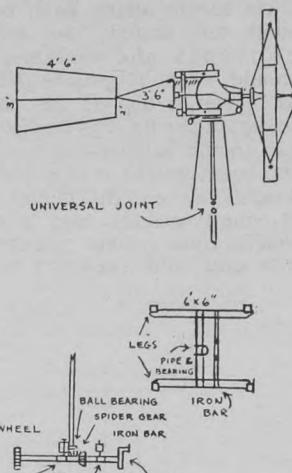
Last spring I bought a tractor and tiller combine but I decided I needed a packer behind it, so I got busy and made one. The frame is from an old drill with a through axle, with a second axle for the second row of wheels. Discarded plow wheels were used and they are spaced nine inches apart, ten in the front row and 11 in the back row. The wheels in the back row are spaced in



between the front wheels. The axles are 18 inches apart and the width of the frame is 8 feet 6 inches. This is an excellent packer and did not clog when pulled behind the One-way.—George W. Ross, Moose Jaw, Sask.

Windmill from Car Parts

It is said that when the first engineer made the first pump the ancestor of an economist told him he couldn't make water run up hill. When the first automobiles were designed no one guessed that used car parts would be put to so

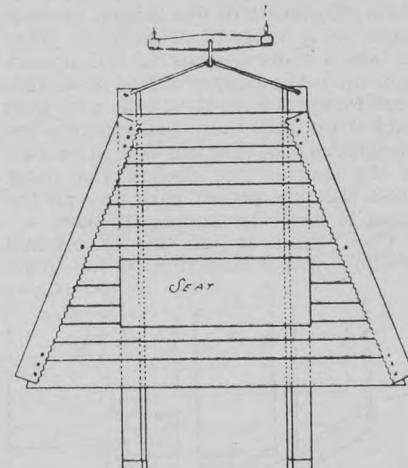


many uses. Now some farmers are making use of them to work the farm pump. R. I. Thomas, of Stettler, Alta., has made a new wind motor out of an old motor car. The illustration is from his drawings.

Simple Two-Row Corn Cutter

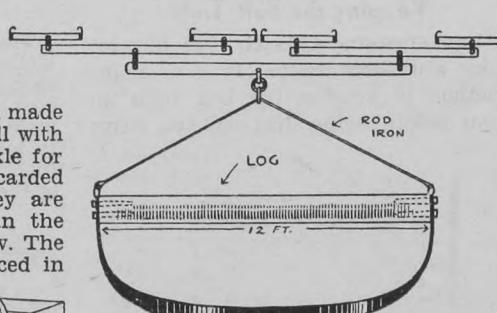
Many farmers do not have a corn binder available, and some kind of a two-row cutter is a wonderful improvement over the old-fashioned hand method of cutting.

The diagram below shows a home-made sled type of two-row cutter. The runners are 2x6's six feet long laid flatwise 28 inches centre to centre with inch boards nailed on the inside and projecting one inch to act as guides.



These are covered with inch boards for a platform. The cutting knives are made from thin pieces of steel with the outside ground to a sharp edge. The front end of knife edges should be 31 inches apart and the rear ends 66 inches. The knives should be at least four feet long.

Root Puller



Take all the spokes out of an old tractor wheel and bend it to the shape of a half-moon. Then cut a log the right length and drive two 12-inch bolts through each end of the metal into the ends of the log. Attach a chain to pull it by and you have a good root puller to go over new brush breaking.—W. H. Smale, Prongua, Sask.

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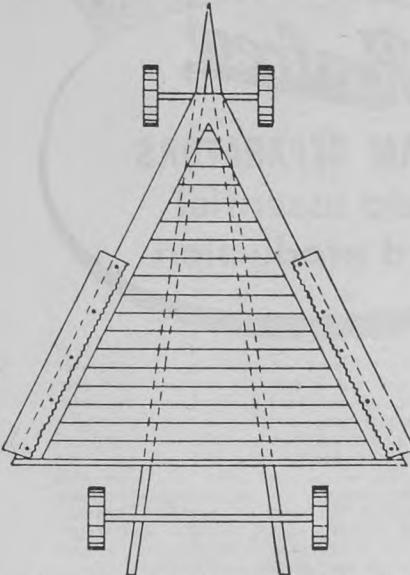
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Homemade Corn Cutter

A wheeled type of corn cutter is shown here. The main frame is made of two 2x4's about eight feet long. They are set on edge and tapered together at the front. The platform is made of inch material. A 1x6 hardwood strip 4 ft. 8



ins. long is put at the rear and also 1x6 hardwood cutting V boards the same length at the sides.

The cutting blades are thin pieces of steel. In some places old cross cut saws are used, with the backs ground sharp, but they are not available on the prairie. The frame should be hung from the axles so as just to clear the ground.

Home-made Buck Stacker

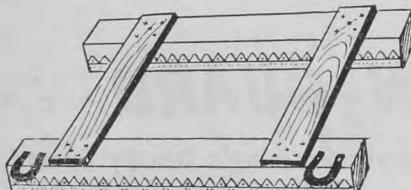
The top and bottom members are made from sound 5-inch poles, or 4x4's,



12 feet long. The $\frac{3}{4}$ -inch bolt at each end acts as a hinge. The centre uprights may be small green willows about $1\frac{1}{2}$ inches in diameter driven into holes in the top and bottom members. The wings are 3-inch poles or 2x6's held firmly with bolts or wooden pegs. All that is necessary at the stack is five peeled poles about 18 feet long. We have had very good success with this stacker on stony ground.

Farm Lane Drag

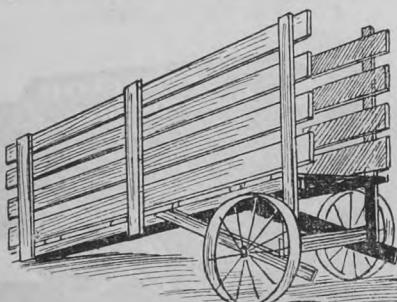
We find this road-drag handy for filling in ruts in the farm lane. The drag consists of two pieces of 4x4 or larger and five or six feet long, according to the length of the mower or binder



knives used. The old worn out knives are fastened to the wood by drilling holes and nailing. The lower edge can be made more firm if some of the rivets are punched out and nails driven through the holes into the timber. Two 2-inch planks connect the timbers and are used to stand on. It is drawn by a chain attached to two old horseshoes, fastened on as shown.—E.A.H., Edgeworth, Sask.

Movable Loading Chute

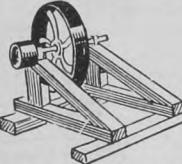
This hog loading chute is moved from one place to another by picking up the end resting on the ground and pushing



it around in wheelbarrow fashion. This chute is mounted on a couple of old corn-planter wheels fitted with a one-inch pipe axle. The height of the floor is changed by shifting the axle to various notches on the lower side of the angle brackets, to provide for different height of wagons and trucks. The chute proper is 3 feet wide, 3 feet high and 12 feet long.

Handy Power Jack

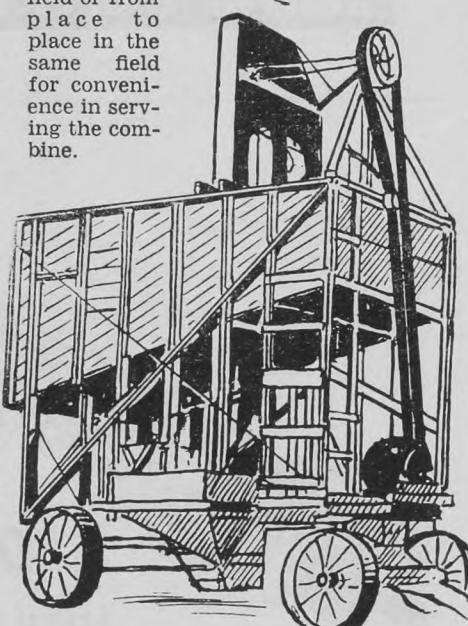
Here is a handy power-jack. It can be used for reducing the speed by running the engine belt on the large pulley and the belt to the machine on the small one, as for a grindstone, concrete mixer, or reciprocating pump; or for increasing the speed by reversing the belt, as for a hammer mill, centrifugal pump, etc. The speed ratio is about four to one, and a 12 or 14-inch pulley on the other end of shaft would give a still greater choice of speeds. With good bearings and lubrication, the loss of power will be quite small, and the flywheel effect of the pulleys help a good deal in sawing wood and similar work.—I. W. Dickerson.



Portable Elevator

This illustration shows the construction of the portable elevator and grain bin on the farm of Allen McCallister, of Portage la Prairie. It holds 300 bushels and is powered by a 3- to 5-horsepower engine. It is mounted on an old threshing machine running gear. It works well with the combine as it has considerable storage capacity. The elevator is of the bucket type and it makes short work of elevating the load of a combine. Besides, it is readily moved from field to field or from place to place in the same field for convenience in serving the combine.

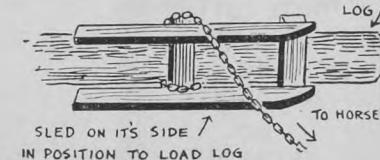
Wings are 3-inch poles or 2x6's held firmly with bolts or wooden pegs. All that is necessary at the stack is five peeled poles about 18 feet long. We have had very good success with this stacker on stony ground.



Using a Logging Sled

When the brush is thick a husky log can only be removed from the bush with some type of sled. A sled for this job can be made out of some light wood or out of cut lumber and only needs a few bolts in its construction.

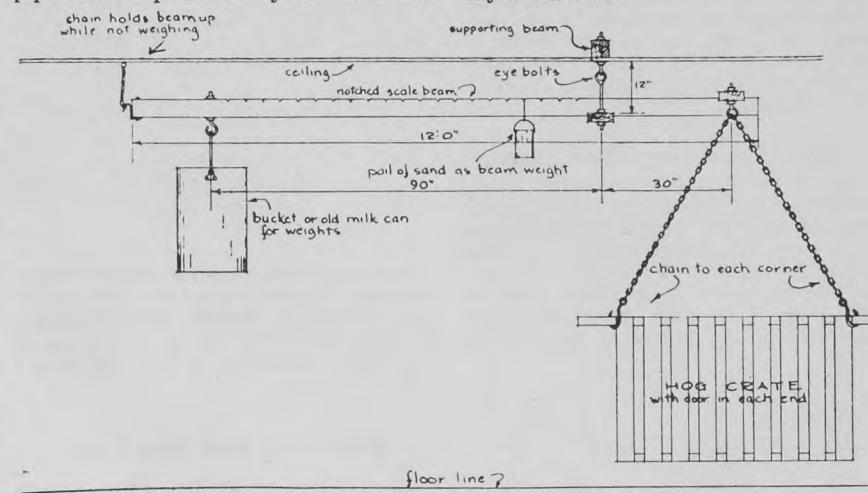
When felling a tree leave a few small branches scattered about so a chain can



be pushed under the log to load it on to the sled. Place the sled on its side next to the log, connect one end of the chain to the sled across bar, then under the log and over the top of the log and sled to the team. The team can then tip the sled down on to its runners with the log on top of the sled. A few railway spikes driven in the top of the sled cross bars, (so they only project a couple of inches) will keep the log on the sled. Without disconnecting the chain, give it a half-hitch around the front end of the log and skid the log out.—W. Kalbfleisch.

Home-made Hog Scale

This is a home-made hog-weighing scale designed by officials of the Alberta department of agriculture. The measurements are given in the sketch. The beam is a 12-ft. 2x4 and it has 29 notches three inches apart. Each notch represents one pound. The beam weight, contents and container combined, should weigh 10 pounds. Use dry sand and keep it dry. If the pail is filled, solder on the lid. The bucket or old milk can should balance the hog crate when the beam weight is removed. For extra weights to use in this bucket make three 20-pound weights and one 10-pound weight from cement run into a stove pipe and chip when dry to the exact



SIDE VIEW

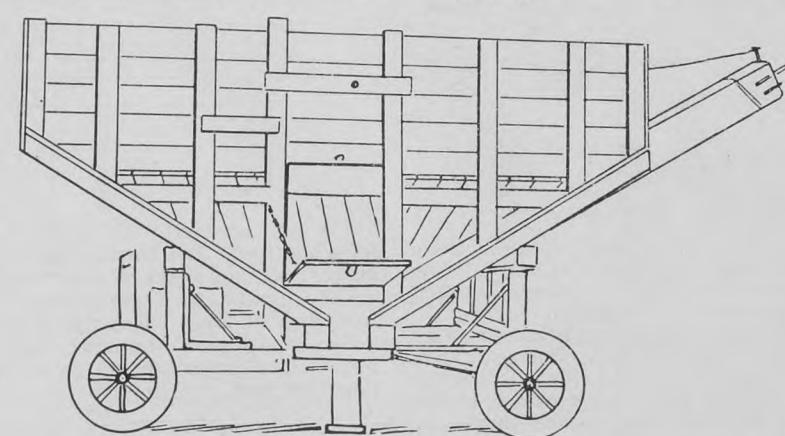
Hopper Mounted on Ford Chassis

This sketch is from a photograph of a grain hopper built by Geo. Halpenny, Strathclair, Man. It is mounted on a model T chassis. The hopper is 12 feet long and $6\frac{1}{2}$ feet deep. It has two cross sills of 6x6, at the bottom and beneath them two pieces of 6x6 hinged to cross pieces with pieces of planking on them to take a wider bearing on the ground. You draw the hopper a foot or so farther forward than it will sit and then back it up until these two supports are upright, so that they will take the weight of the load off the chassis. Two other cross sills are placed part way up the slope to keep the hopper in place.

The engine is left in its original position and is attached to the auger

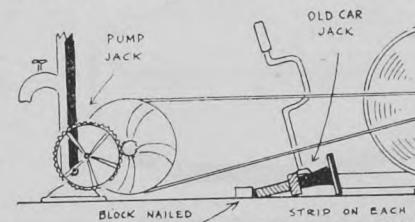
of the elevator by two universal joints. The auger is nine inches in diameter and 14 feet long, and is out of the annex of an old elevator. It is in a square box or spout, in the lower two corners of which are pieces of 2x2 ripped from corner to corner to help hold the grain up to the auger. On the side of the hopper is a door which lets down so that grain can be shovelled out of a bin or granary and elevated into a truck. The frame is of 2x4's lined with shiplap. An iron rod across near the top keeps the hopper from spreading.

A similar assembly made a year ago will elevate 125 bushels into a truck in five minutes, Mr. Halpenny informed The Guide.



Keeping the Belt Tight

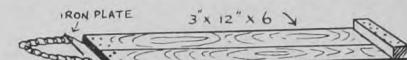
I am enclosing a sketch of an idea for your workshop section. It is a simple method of keeping the belt tight on your pump engine. Just put two strips



of 1x2 for the engine to slide between when it is properly lined up with the jack. And use an old car jack to push it tight. This can be slackened off each night, if desired, very easily.—N. Reid Clarke, Didsbury, Alta.

Boat for Barrels

This boat consists of two planks 12 inches wide and six feet long, fastened together at the rear by a strong 2x4 on top and in front by a quarter-inch plate, 12x24 inches, and bent as shown. It takes eight three-eighth-inch bolts with round heads to attach the plate to the planks. The heads are down and



the holes are squared with a punch so that the shoulders of the bolts will catch on them and prevent the bolts from turning when tightening. When using the boat to draw water I nail an old auto tire on the planks to keep the barrel from slipping. Another tire is used to hold the cloth over the top of the barrel. A neighbor built one of these with three 12-inch planks eight feet long and another 2x4 in the middle.—James E. Moscrip, Major, Sask.

SECTION 5

Livestock Feeding and Watering

Field Self-feeder for Hogs

When 10 or more pigs are kept the labor-saving feature of a self-feeder merits attention, says the Alberta department of agriculture in explaining this easily constructed self-feeder for hogs. It saves 60 per cent of the labor, reduces waste and gives the weaker pigs a chance, though it is best to keep hogs of the same size together. Trough space

trough. For outside use lids can be hinged over the trough to keep out the rain and prevent the dry feed from blowing. Hogs soon learn to lift the lids. A separate lid is made for each one-foot section.

Sides, ends and roof are covered with shiplap and the roof covered with ready roofing. A canvas strip nailed over the ridge prevents rain from entering. The overhang of the roof is to prevent rain from dripping into the trough.

A feature of the trough is the adjustable slide. It consists of a 6-inch board, held by flexible wooden slats $\frac{3}{8} \times 1\frac{1}{2} \times 28$. They are nailed firmly to the slide board as shown. The slots at the top are in the wall of the feeder and provide for the adjustment of the slide board. A feeder six feet long will accommodate 24 pigs.

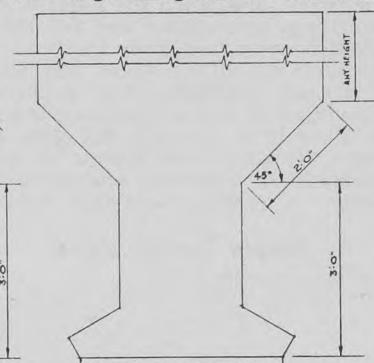
The lower cuts show how the feed capacity of the self-feeder can be increased. With the extension shown on the left a six-foot feeder will hold approximately three-quarters of a triple wagon-box load of ground grain. For inside use

is saved and since grain is before the hogs all the time, digestive trouble from overloading the stomach is reduced.

The illustration gives most of the construction details. The skids are 10 feet long and the sills are placed three feet apart. The main floor is covered with matched lumber and the V-shaped part is best covered with galvanized iron to make the grain slide down more readily. The 2x2 braces are a foot apart and are let into the front side of the

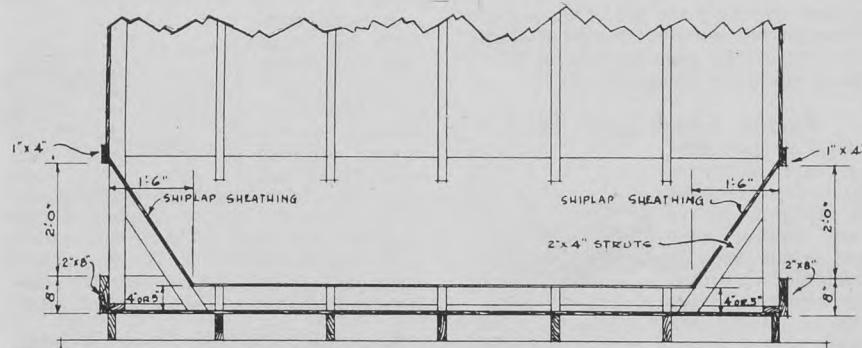
extension shown on the right can be carried to any convenient height.

the extension shown on the right can be carried to any convenient height.



the extension shown on the right can be carried to any convenient height.

Grain Self-feeder for Cattle



An A-1 self-feeder for cattle can be converted from an old granary, according to this plan, also by the Alberta department of agriculture. The building is blocked up 20 to 24 inches above the ground. Leave the first 8-inch board on the bottom of two sides and an end and remove the next three boards above it. This leaves an opening two feet deep.

Next construct baffle boards on two sides and one end of the interior, as shown in this cross-section view. Frame in the struts of 2x4 stuff, one at each

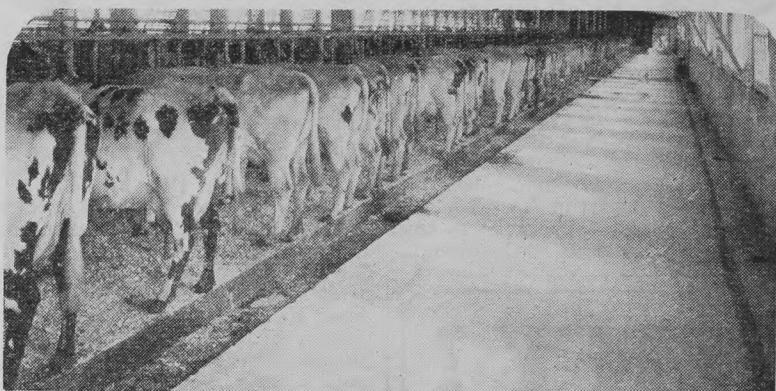
stud. It would be safer to have the bottom of the strut come directly above the joist as there is considerable weight on the baffle board. Cover the struts with shiplap as shown and the job is done. The illustration shows the framing and gives an interior view of the back end. Do not be confused about the bottom of the baffle board at the back. It might be mistaken in the cut for a false floor. There is an opening 4 or 5 inches deep at the bottom of the baffle board to allow the grain ration to flow within reach of the cattle.

Keeping Ice Out of Trough

Here is our plan to save chopping ice out of a watering trough. Lay one end on the well cover or other support so it is about an inch higher than the other end. Then bore a small hole through

the lower end and provide a plug to close the hole. In very cold weather, remove the plug and drain out the water into a pipe or tile as soon as the stock are through drinking, corking the hole again when it is needed the next time. —J.D.

Beatty Pasture Comfort Sanitary Steel Stalls



Beatty stalls keep stock comfortable.
Comfortable cows give more milk.
Beef make greater gains.

Stock Kept Clean with Less Help

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IMPERIAL BANK OF CANADA

"The Bank for You"

Cafeteria Furniture for Chicks

Here are three gadgets for helping little chicks to help themselves. On the left is a waterer. It consists of a deep pie plate with one-half inch board cover having holes bored in it as shown.



The middle cut shows a chick feeder. It is cut from one of these round cardboard oatmeal containers and allows the chicks to feed while preventing them from getting their feet into the dry mash. On the right is a self-feeder that can be moved easily from place to place. It is an old syrup tin, with the handle left on. Holes are made in the sides for the chicks to feed through.

WHY?



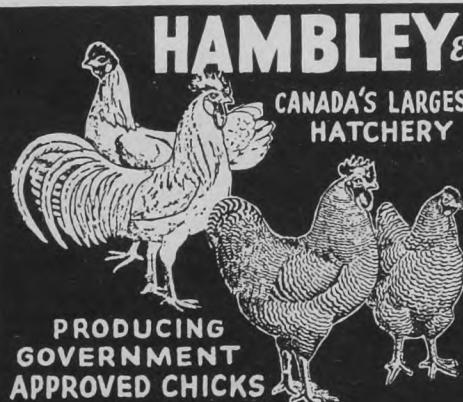
Why should Sunny Boy Cereal be on every kitchen shelf? Because its tempting, delicious flavour appeals to every member of the family. Because it's made from wheat, flax and rye, three nourishing Canadian grains which give young and old energy and pep. Sunny Boy Cereal is Canada's "formula for fitness."

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PRODUCING GOVERNMENT APPROVED CHICKS

Pure Bred-to-Lay Government Approved Chicks from Banded, Blood-Tested Flocks. This is the modern way to start or maintain an outstanding Pure-Bred Flock. Since 1927, thousands of Western Canada's Leading Farmers have made outstanding success with Hambley Electric Chicks. You can depend on our Service and quality, year after year.

Hatching Eggs Wanted

From government-approved blood-tested flocks. Write us for particulars. Latest Poultry Remedies, Worm Capsules, Nicotine Sulphate, Chick Zone, Vapo-Spray, etc.

J. J. HAMBLEY HATCHERIES

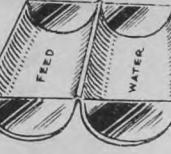
WINNIPEG, BRANDON, REGINA, SASKATOON, CALGARY, EDMONTON, PORTAGE, DAUPHIN, SWAN LAKE AND ABBOTSFORD, B.C.



while a funnel, upside down with a cork in the end, keeps the feed flowing out to within the reach of the chicks

Double Trough

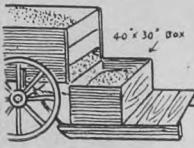
A discarded hot water tank can be made into a serviceable feed and water trough by having it split, except for one side, and then opened out. A prairie



farmer in Alberta sent in the photograph of the trough from which this drawing was made. He claims that it will stand a lot of hard usage and is easy to keep clean.

Seed Box Filler

Filling the seed box is a hard job if one has to scoop every handful out of the wagon box. With this device it is a bit easier. Simply trail a small stone boat behind the wagon by hitching it to the rear axle with a chain. Put a box big enough to hold a few bags of grain on the stone boat, open the end gate and the seed will run into the box. The box should be a little wider than the wagon box to prevent spilling.—E.A.A.



Water Trough for Calves

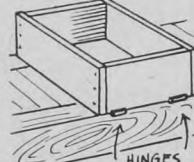
This idea came from Kansas and was published in Successful Farming but it will work equally well here. The farmer cut down an oil drum until it was slightly lower than the edge of the watering trough. The water pipe from the pump runs to it and the tendency is for it to keep full, so that the water is within reach of the calves. The over-



flow from the drum supplies the tank. It is necessary to weight the drum down so that it will not be shoved around by the cattle when they come to drink.

Sanitary Feed Box

To make a feed box that is easy to clean, attach it to the manger with hinges as shown instead of nailing it in place. It can be quickly cleaned by turning it over.



Keeping Water Tanks Ice Free

If you have a tank for watering stock get enough cardboard from old boxes to put around the outside of the tank, opening them up and breaking joints with another layer; or a newspaper will do for breaking the joints. With a top

made out of two-inch lumber preferably, so that it will not sag, the water will be kept warm at all times. Two or three strands of soft wire will keep the cardboard in place. I have found the round tanks better to keep the water warm than the long ones as the ends freeze a lot quicker.

Another idea. When once the fire in the tank heater is going good, if you cover the air vent till the wood is about two-thirds burnt you can put a burnt stick into the water till the fire is out and then knock off the charcoal. You can have all the charcoal you need for the chickens and pigs by doing this.

Adjustable Nose Bag

This adjustable arrangement for attaching the nose bag is very handy. The slide makes it possible to adjust it for any horse after placing it on his head. The wooden block will grip wherever it is placed. Horses heads vary in size and with this arrangement you don't have to keep their nosebags separate.

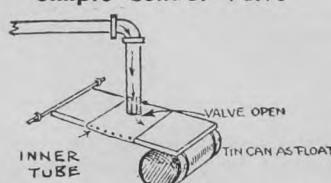
To Save the Birds

Many song birds are drowned every year while trying to get a drink at stock watering troughs on account of the rise and fall of the water. They try to reach



the water while standing on the edge of the trough and, when the water is low, sometimes overbalance and fall in. In addition every bird lover wants to see the birds get all the water they want. It is easily accomplished by anchoring a bit of plank with a string long enough to allow it to rise and fall with the water. The bird can always sit conveniently on the plank and reach the water.—A. S. Wurz, Rockyford, Alta.

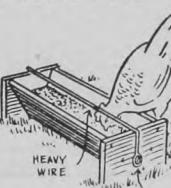
Simple Control Valve



This is a simple way to make a valve to control the flow of water from a tank to a trough. It brings in another use for the well-known inner tube. A bit of board is hinged as shown. To it is attached an empty tin can of say a gallon capacity. This presses the rubber against the end of the pipe and shuts off the water when the trough is full.

Poultry Trough Saves Feed

One of the simplest and most reliable feed troughs for keeping hens from soiling the feed is this one. It resembles an ordinary feed trough except that there is a strong wire fastened across the top, running from end to end. This simple device prevents the hens from getting their feet into the trough and wasting or contaminating the feed.



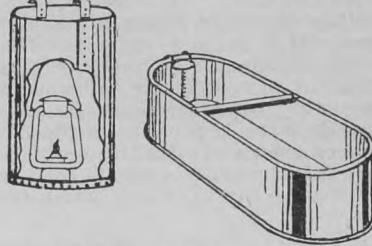
Keeping Hog Trough Clean

The bottom of a V-shaped wooden hog trough can be kept clean, but it takes work and time to clean it. If left uncleared, the feed in the bottom sours and rots and hogs become unhealthy. To save this trouble and waste of feed, take a piece of 1x3 lumber the full length of the trough, bevel the lower edges with a plane, and nail it tight in the bottom of the trough. Now the pigs can get all the feed and there is none left to sour.—I.W.D.

Lantern to Heat Stock Water

Here is a very convenient and satisfactory way for keeping ice out of a tank in a barn where cattle or sheep are run during the winter.

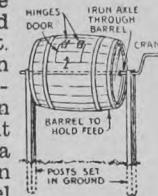
The small tank helps to keep the temperature of the water higher. Also bank the tank with six or eight inches of manure and have a cover to drop over the tank during extremely cold weather. Take an old can about eight inches in diameter and 18 inches long, remove



one end, and have hooks attached to the open end so it will hang inside the water tank. It is necessary to weight this open tank down. A lighted lantern set in this open tank will help keep ice from forming on the water, with the help of the cover in very cold weather but provision would have to be made for the fumes to escape. A lantern will burn from 24 to 36 hours, so the cost isn't much.—I.W.D.

Dry Feed Mixer

Dry feeds can be mixed quickly and easily with this outfit. An ordinary wooden barrel is mounted between two posts on an iron rod which is bent at one end to form a crank. A door is cut in the side of the barrel and fitted with hinges and a hook to hold it tightly shut.



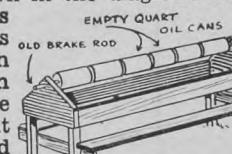
Feeding Orphan Lambs

Here is an idea we worked out for feeding several lambs which had to be fed by hand. Feeding them from bottles was too slow. Take a pail, drill a hole near the bottom, solder on a short length of pipe, with a slight rim or bulge at the other end over which we could slip a nipple without being pulled off. A frame was made to hold the pail, and this is set where the lambs can help themselves. Works fine, and the lambs learn to drink quickly.—I.W.D.



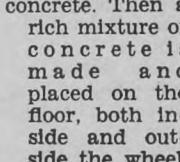
Guard for Poultry Feeder

A simple way to keep chickens from roosting on and dropping into poultry feeders is shown in the diagram. Take empty tin cans with the tops still on, punch a hole in each end just large enough to fit over an old auto brake rod long enough to reach the length of the feeder. Slip the proper number of cans over the rod, then fit it in slots cut in each end of the feeder. When chickens light on top of the feeder, the cans revolve and they will soon leave it alone.

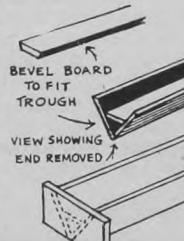


Watering Tank from Tractor Wheel

This tank has to be permanently placed. The wheel is a large drive wheel from an old fashioned tractor. The hub and spokes are first removed and then it is laid on its side on a strong reinforced foundation of concrete. Then a



rich mixture of concrete is made and placed on the floor, both inside and outside the wheel, to make it water tight. If there are any leakages in the rim the cement may be brought up inside it almost to the top. To get a good shape for this lining a template should be made. It is fastened in the centre at the bottom, with the upper part resting on the upper edge of the rim. Then the template can be turned round and round to shape the concrete lining. This trough was first described by Popular Mechanics, from suggestions made by an Iowa farmer.



per, yet removed in a few minutes if desired.

The plate and end of drawbar have corresponding holes drilled in them; they are securely bolted together, with plate on top, through the bumper bracket.

Although by no means designed for heavy-duty service, it will, when made of at least $\frac{3}{4} \times 1\frac{1}{2}$ -inch stock, handle loads within the reasonable capacity of the tow car. The drawbar can be adapted readily to any car with a type of bumper attachment similar to the new Fords or Chevrolets.—R.S.Y., Sask.

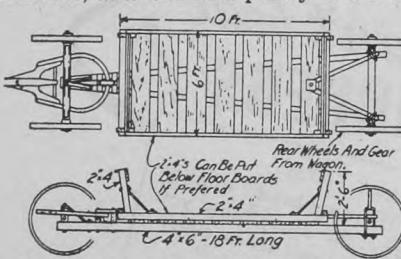
Steering Device for Trailer

The accompanying drawing shows a drawbar and steering device for either a trailer hitch for a four-wheeled trailer made from an old automobile or for a horse-hitch for a similar vehicle. Steering is accomplished through an extension of the main drawbar to the rear of the axle which is coupled to a shortened drag link (A) made from a part of the original steering mechanism of the Model T Ford car. The drawbar itself is made of extra heavy wrought iron and it is important that this part of the hitch be made of the weight of material specified to prevent it from bending under the heavy load it will have to bear. A one-piece pillow block bearing makes the best type of anchorage for such a hitch and lock nuts should be used on the main draw bolt passing through this bearing. It is important that the trailer tongue is free to move up and down though it must always be possible to keep it tight so that steering of the trailer will be controlled. The large bearing surface of the flat plate on either side of the front end of the hitch where it is coupled to the rear end of the trailer tongue provides the necessary bearing surface to prevent looseness at this joint.

The greatest difficulty usually met with in the use of four-wheeled trailers is the tendency for these vehicles to weave badly when following a car. This is due usually to the destruction or maladjustment of the caster action of the front axle. Any garage man will know how this should be adjusted, but in any car with transverse springs, such as has been employed in practically all old models of Ford cars, it is important that the radius rods be kept in good condition and properly coupled to some reliable anchorage on the underside of the trailer chassis. Too much caster action in the front axle is likely to result in a wheel wobble closely associated with a "shimmy" while too little caster action causes weaving of the vehicle or the destruction of the natural steering qualities of the vehicle. Overloading of trailers or wagons is likely to disturb the set of the springs and destroy the caster action. For this reason farm wagons made from old automobiles had best be rebuilt so as to remove the springs altogether.—L. G. Heimpel.

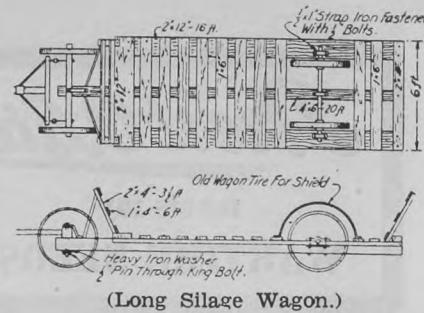
For Handling Bundle Corn

One of the greatest labor-saving devices in handling bundle corn is the low-down rack. The short type is the most easily constructed and the most common, and will hold plenty of a load



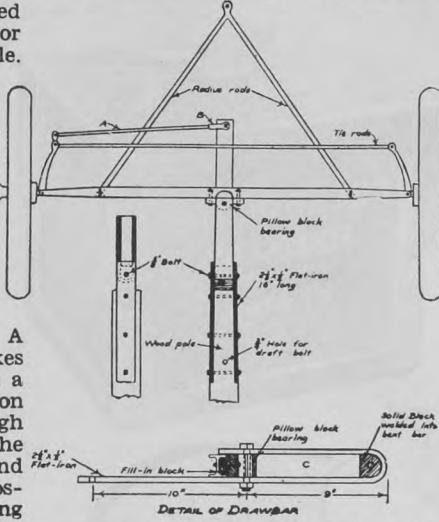
(Short Underslung Silage Wagon) where the distance is not too great. The sills are 4×6 's 18 feet long swung underneath the rear axle by means of heavy clamps, the rear reach being bolted on top of the back cross board of the platform. The sills are brought together and bevelled at the front and bolted together.

The regular kingpin on which the front axle pivots is removed and replaced with a longer one, which is either threaded at lower end and nut, and lock nut put on below the 4×6 's, or else is bored with a three-eighths inch hole and heavy washer and machine bolt put on below.



(Long Silage Wagon.)

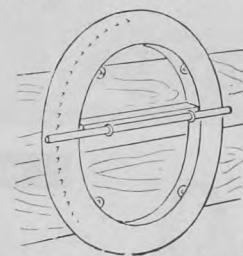
The long type is not quite so common or so easily made, but has a much greater capacity. It can be built in much the same way as the other type



by swinging the timbers under the rear axle of an ordinary wagon, or, as shown in the cut, is made from two mower wheels mounted on the old mower axle or piece of gas pipe of the proper size for an axle. This is clamped to the top of the timbers by clamps made of old wagon tires fastened with half-inch bolts. Guards to go over the rear wheels are made of the same kind of material. The front wheels shown are from a low truck wagon, or the front wheels of an ordinary wagon can be used if preferred. The same arrangement of kingbolt is used as shown for the short type.

Mounting the Trailer Spare Tire

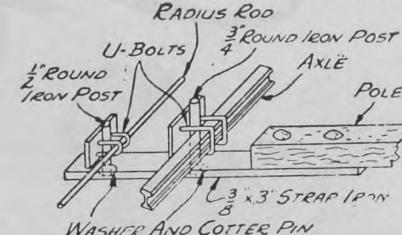
The accompanying sketch shows a simple way to mount the spare tire for



the farm trailer of the wagon box type. This carrier is nothing more than a 2×4 a little less than the net inside diameter of the tire rim, bolted on edge to the outside of the box. Eye bolts are turned into this 2×4 , the tire hung in place then a short length of pipe pushed through the eye bolts (screw eyes) to lock the tire in place. For larger tires, the thickness of the bolted member will have to be correspondingly wider. In any case its width should be such that the pipe makes a snug pinch fit against the tire. This holds it in place and prevents it from working out of the screw eyes.

Auto Trailer Hitch

The diagram fully explains a simple and convenient trailer hitch which can

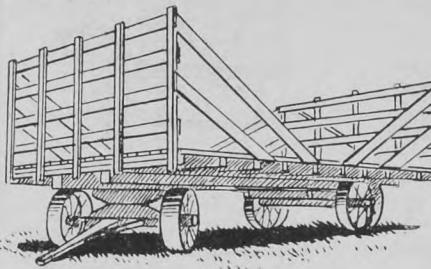


be used for any four-wheel trailer or for trailing an auto behind a truck or another auto.—I.W.D.

Traction-Drawn Rack

Two of these huge racks are used by Geo. Paddock, of Swan River, Man., in his threshing operations. Each will hold

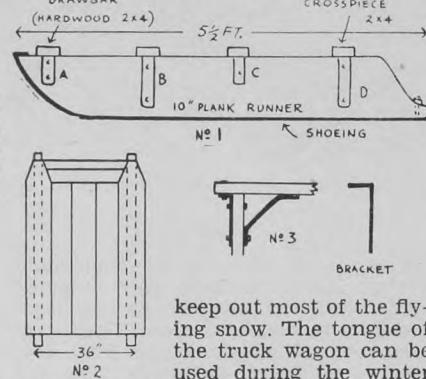
as many sheaves as three wagon racks. It is 10 feet wide and 18 feet long and is built on the same principle as the ordinary rack. It is hauled by the tractor. Three pitchers work on the field and two at the machine. The rack is carried on the running gear of an old threshing machine. The sills can be made of 6×8 or 8×8 timbers or of straight spruce logs. A strong flat iron brace runs back from the lower end of the king bolt to a cross piece between the sills. A heavy ring is held by an eye-bolt in the rear axle to hitch another wagon to.



Extended Wagon Facilitates Scooping

The design of this wagon box has two distinct advantages. By sloping the box outward, about 30 per cent bigger load is possible and by extending the bed

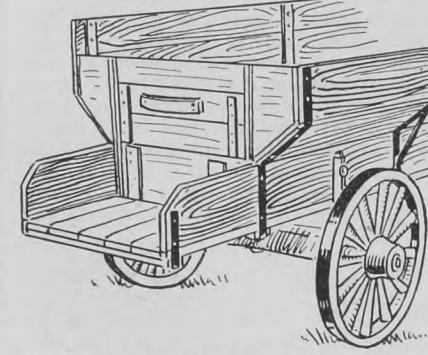
wood fastened near the front with two of the outside brackets. The shoeing may be made of old buggy tires. I fastened my shoeing on with $1\frac{1}{2}$ -inch screws, with a bolt at the rear as shown. Sketch 2 shows the completed gear with floor built over the cross pieces. Building the floor this way makes the outfit stronger and also leaves a convenient step on the outside. For our own rig I used the rear half of a model T touring body, cutting the tin at an angle about a foot ahead of the back doors, and fitting a dash high enough to



keep out most of the flying snow. The tongue of the truck wagon can be used during the winter and replaced in the spring again.

Latch for Drop Endgate

The diagram shows a very convenient latch for the drop endgate for a two-



wheel trailer box. If properly installed, then the usual cross rod can be omitted, since the latch not only holds tightly but prevents the box sides from spreading. Part No. 1 is one-fourth inch by one inch by four inches long, and is fastened near the top of the endgate with two heavy stove bolts; while No. 2 of the same size is fastened with one bolt near the top of the box side so it will lift up and catch when the endgate is slammed shut. A screw or nail should be set under No. 2 so it will not drop down too far for No. 1 to strike under the curved part and raise it.—I.W.D.

Serviceable Jumper

The runners are made from 2×10 about $5\frac{1}{2}$ feet long. The cross pieces, B, C and D, are 2×4 securely fastened by means of brackets shown at Fig. 3, though perhaps two sets of inner braces will be enough. The drawbar A is hard-

How To Make A Boat

Get two boards, A and B, 12 feet long, 20 inches wide, and $\frac{3}{4}$ -inch thick. Cut them both as illustrated.

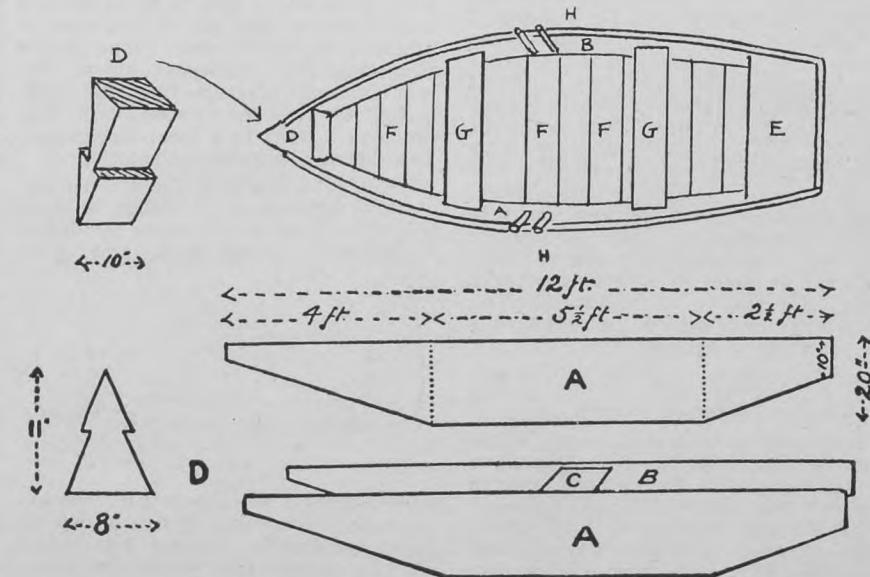
Nail a plank C between them at the centre to hold them in position, and a second similar plank below it.

Cut solid block of wood D to form the stem or bow-piece, and a stern board about 2 feet long, 10 inches deep.

Join the two bow ends of A and B by screwing them into the block D.

Join the two stern ends by screwing them to each end of the stern board, and strengthen by screwing stern seat E on to both sides and stern-piece.

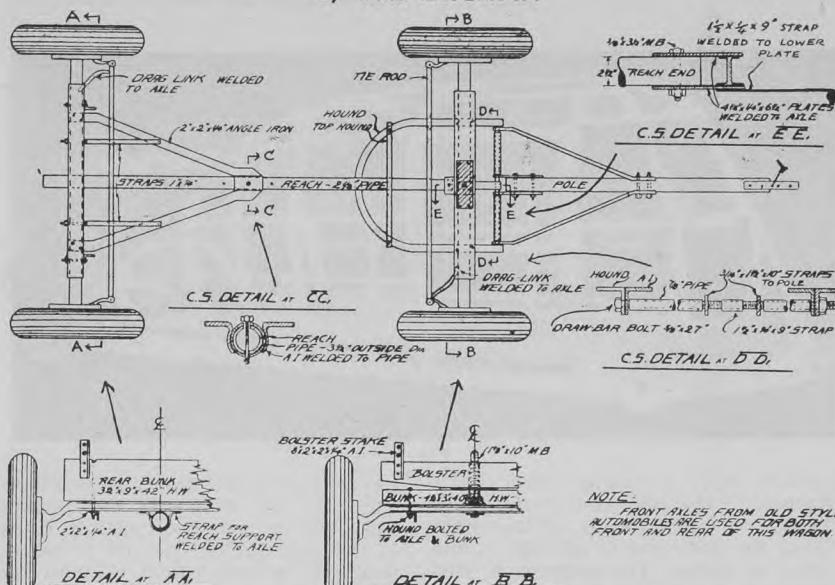
Turn to boat upside down, and screw on planks FF to form the bottom. Caulk the seams between these by driving in tow by means of a blunt chisel and mallet, and paint them with pitch, if necessary, to make them watertight. Mark where the seats GG are to come, and nail pieces of plank to the sides of the boat, reaching to a height of six inches from the floor, to act as supports to the seats. Put the seats in resting on these chocks, and screw them to the sides. Screw a pair of strong wooden pins to each side of the boat H H to form rowlocks. Knock out plank C, and your boat is ready.



Wagon Frame from Auto Chassis

One that will trail at high speed

By W. KALBFLEISCH



ALTHOUGH every other farmer has made some kind of a wagon from an old car, there is always something new and better. The wagon illustrated is an all-steel construction job which has been designed to trail well at high speed and to back up with a heavy load easily. This feature is obtained by having the complete front trucks turn like a wagon and not like the wheels of an automobile.

Two front axles and wheels from wrecked cars, some scrap angle iron, seven feet of old two-inch pipe, and some pieces of strap iron are the main parts needed for the wagon. By varying the construction according to the scrap iron laying around the yard, the wagon can easily be built for twenty-five dollars even though much of the iron is purchased.

Construction of the Rear Wheels

When obtaining car axles and wheels for the wagon, you should endeavor to obtain wheels which will take the common size of tires so the tires can be readily purchased second hand. The axles of the car can be laid down in their natural position for a low wagon or can be turned up to give good clearance. When left low as in a car, however, the wagon can not be made to turn sharp unless a narrow box is used.

The rear hounds are attached to the axle by two bolts placed in two of the holes formerly used by the spring clips. The other two holes are used to bolt the rear bunk to the axle.

A flat plate welded to the top of the axle, or a plate clamped on to the axle makes an excellent flat bed for the bunk. In order to obtain sharp turning, the rear bunk is made to be just about as high as the wheels. At the front end the rear hounds are welded or bolted to a short piece of pipe which will easily slip over the reach pipe. This pipe has a large hole in it for the reach pin, so the rear trucks will be free to move over rough ground. Angle iron can be bent by sawing a "V" out of the flange and then joining the iron by electric welding. The bend can also be made by heating the angle in a forge and holding it in a heavy vise while giving the iron a twist.

Construction of the Front Trucks

The half circle hound can be formed by giving the angle iron a series of short bends when red hot. The top hound is a straight piece of angle iron placed above the reach pipe and spaced by two short pieces of pipe about two and a quarter inches long.

The plates used to connect the front end of the pipe reach can be formed by putting a "U" shaped piece of heavy flat iron around the axle. This eliminates a welding job and is possible because the central strap to the cross rod for the pole has been found to be unnecessary. A heavy bolt (at least 3/4-inch) should be used in the front end of the reach because of wear on the bolt due to turning.

The king bolt must be placed in the lower bunk with its head down as illustrated, and set in place before the lower bunk is bolted to the axle. Since the lower bunk is not heavy, the king

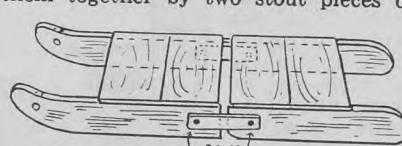
bolt can not do much work and therefore I advise you to put cleats on the wagon box alongside of the rear bunk stakes and omit them on the front.

Once you have a sturdy rubber-tired wagon to go behind horses or a rubber-tired tractor, you will consider it the handiest piece of equipment on the farm.

Greasing Wagon Wheel

It is quite difficult to grease a heavy wagon alone. Here is a suggestion that makes it easier. Cut a notch in an 18-inch piece of 2x4 and place it on the inside of the wheel against one of the spokes. Lift upward on the opposite side of the wheel and it will slip out quite easily. The process may be reversed for replacing the wheel.—A. Froberg, Milden, Sask.

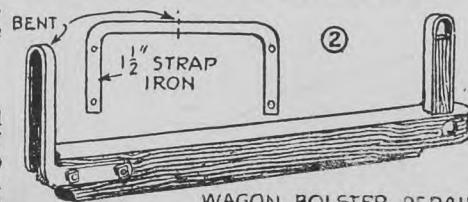
Jointed Jumper
By simply cutting the runners of a jumper in the middle and fastening them together by two stout pieces of



flat iron each with two bolts, you have made it easier for it to run over rough or uneven ground. The bolts are not drawn too tightly so that there is freedom of action. It makes a smoother running rig in every particular.—W.S.A., Rockyford, Alta.

Repairing Bolster

Sometimes water gets into the mortise of the wagon bolster and causes decay which weakens it so that it breaks. This shows a simple way by which a repair can be made. Take 1 1/2-inch strap iron and bend it as shown in the diagram. Then attach with bolts.



WAGON BOLSTER REPAIR

Speeding Up the Farm Wagon

Attaching old auto axles to a farm wagon converts it into a rubber tired car trailer or wagon. From an auto junk yard obtain two front axles of the type shown in the cut. Saw off the skeins on the front wagon axle and fasten the car axle in place with heavy bolts. Give the rear axle the same treatment. Nothing is removed from the wagon but the skeins.



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INVENTIONS

and the Post-War World

By CECIL C. KENT, Patent Attorney
(Fellow the Patent Institute of Canada)

WHAT are the prospects of success for independent Western inventors in the post-war world? Well, after the last war quite a number were paid handsome cash sums for patent rights on ideas which they had developed, while others augmented their incomes for many years with royalty payments from patents which they had licensed to manufacturers. Still others went into business, manufacturing or distributing the patented invention and it is surprising how many machine shop businesses were established in some such way.

Yet normal industry during the last war was not transformed anything like it has been this time and there was very little shortage of civilian requirements. Nonetheless the war's end introduced very many new processes, products, etc., all patented up to the hilt, you may be sure.

But the waging of this war has left hardly any manufacturing business unchanged, and since civilian needs have been cut to the bone, the potential post-war demand must be enormous. Anticipating this, manufacturers are already advertising in the big American papers, and monthly magazines of science and technology for inventors to come forward with their ideas as soon as protected with a view to their post-war production.

Most pre-war tools, dies, etc., will be worn out and there will be such competition from a more or less scratch start that few manufacturers will dare give their rivals the chance of labelling their lines "pre-war."

There has been a wide-spread idea that patents cannot be taken out in wartime. This is wrong and may result in some inventors losing out in the avalanche of patent applications which will probably be filed when peace comes. For those with ideas of practical merit the time to file is now so as to gain valuable months of priority in the realization that when conflicts arise in the patent office, the winner is the one who applies first in the overwhelming majority of cases.

It is my belief that anyone can make inventions of profitable and patentable merit if the desire is sufficiently strong and is disciplined and wisely guided into practical channels. Inventive ability can be roused to activity through developing curiosity and observation and the person who makes a habit of investigating the operation of each new thing he sees, will obviously store up a great deal of information which he can juggle with and transpose into unlimited new arrangements. These arrangements will be his inventions, and most inventions, whether they be of the simple but ingenious kinds shown in this book, or those upon which valuable patents have been obtained, are mainly a combination of individual parts, all of which or most of which were well known when taken separately. Sometimes something new has been added, but often only the re-arrangement is sufficient to make the result worthy of being called an invention.

It is interesting to note how many inventions started out with imitations of human movements, particularly movements of the hands and fingers. Even the engineer whose job consists in designing machinery for doing particular jobs, such as a wrapping machine for instance, generally starts with a mechanical imitation of hand and finger movements. By stages he then refines the necessary sequence of action, eventually arriving at the highly ingenious finished product in which it is very difficult to recognize any resemblance to human movements.

When an invention worthy of a patent has been made, no time should be lost in applying for protection, and generally speaking, the construction of it should be preserved in secrecy at least until the application has been filed, and sometimes until the patent has been issued. An estimate of the charges involved can always be obtained from the patent attorney whom you select, the cost generally depending upon whether the invention is of a simple character or of a more complex nature. It is seldom however that the charges for protection are beyond the person of average means and are definitely less than a great many people think.

It can be said that many of the most successful inventors have been people of very limited means, and no inventor who has an idea of merit and uses a little ingenuity in its commercial development, need be defeated through lack of cash in his bank account.

A Design for a Snowplane

Much of it can be built at home by the mechanically-minded man

THE snowplane here described is built by C. T. Lount, 95 Higgins Ave., Winnipeg, from whom, in normal times, the plane or any parts of it can be secured. A good deal of the construction can be done by any man who has a good set of tools, knows how to use them and has a mechanical bent.

Some of the parts, as for example, the propeller, would have to be purchased readymade. The line drawings on this page are from a model used by the Manitoba Game and Fisheries branch. The cut of the skeleton (Fig. 1) is from a photograph of the actual framework.

The overall length of this snowplane is approximately 16 feet. The body is about 12 feet long with an inside height

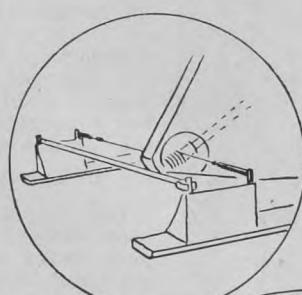


Fig. 2—Side View.

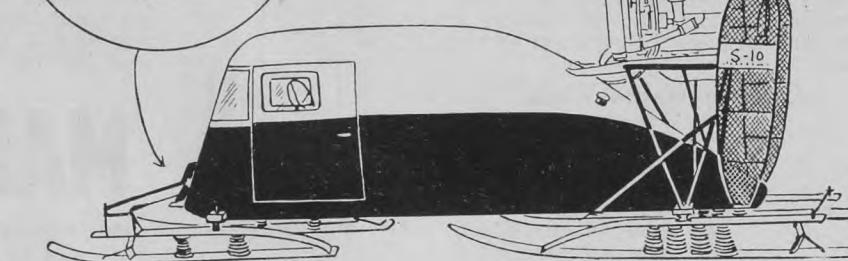


Fig. 3
Rear View.

of four feet and an inside width three inches less. The distance apart of the skis from centre to centre is 42 inches. The skis are 7½ inches wide; the rear skis are eight feet long and the front ones six feet. Light weight is an important consideration in a snowplane. This one weighs about 900 pounds.

The framework of the cabin (Fig. 1) is built from good selected wood that is available, such as fir or spruce. The framework is built upon two 2x4 sills which must be sound and straight grained. These sills are joined together with cross pieces of the same material and must be rigidly braced. The bottom of this frame is covered with good sound flooring, so that the framework will not catch the snow. The superstructure, except for the windows and a door on one side, is then covered with plywood, which can be curved to fit. The edges of the bottom are protected by angle steel and light metal angle striping is placed around the door opening. The two centre panes of the windshield are of glass, the other panes, including the one in the door, are made of thick aircraft Pyralin.

Inside, the front seat may be hinged to the floor so that it will tip forward for easy access to the rear single seat and the storage space. An eight-gallon fuel tank is located in the rear of the body.

This snowplane is powered by a Model B Ford engine. Fuel consumption averages about 10 miles to the gallon. Some alterations are necessary to mount the propeller on the engine and the parts, like the propeller, would have to be purchased readymade. The engine is mounted on two oak sills. These are supported by tubular steel as shown (Figs. 2, 3 and 4). As will be seen from the drawing (insert Fig. 4) three supports rise on each side from the rear bunk. The two centre supports each cross to the sill on the opposite side to give additional bracing effect.

The full thrust of the propeller is forward on the main sills. To take this heavy strain strong tubular steel braces extend downward, inside the body, from the end of the engine sills to the main sills. At the top these braces are bolted to flat steel stirrups bolted to the engine sills. Additional bracing support is given by crossing these braces as shown in detail (Fig. 4).

The propeller is protected by a guard of wire mesh. The framework of this

It will be seen that each pair of skis has a spacer which keeps the skis in line. The weight of the body, engine and load is carried by two main bunks attached to the skis as shown, by a

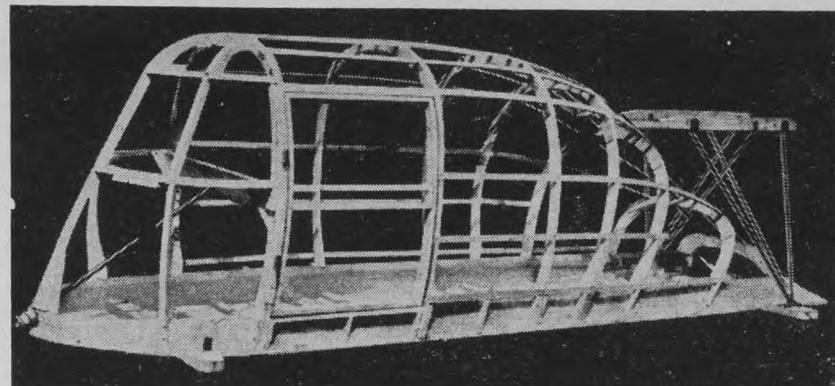


Fig. 1

guard is built of tubular steel. It is attached to the rear end of the main sills and is braced both to the main sills of the body and to the sills of the engine as shown. The radiator in this snowplane is specially designed to provide the correct amount of cooling for

special part which has to be purchased. The steering device is very simple. The steering rod shows plainly in Fig. 1. On the end of the rod a spool is mounted, around which a small steel cable is wound. Each end of the cable is then fastened to its appropriate front ski just behind the spacer as shown in Fig. 2.

The propeller is slightly tipped—the angle is five degrees, so as to give it a certain amount of lift. The placing of the engine makes a considerable difference in the push, as it has to be located properly in the slipstream to get maximum results.

Fumes and Trailer

The carbon monoxide from the car exhaust sometimes kills animals hauled in trailers, and owners will do well to slip an extension over the exhaust pipe and fasten it to the bumper so as to throw the fumes out at the side, or better to put a piece of conductor pipe along the trailer frame and connect it loosely to the exhaust pipe with a flexible hose, so as to carry the fumes back of the trailer.

the Model B Ford engine. A standard six-volt 13-plate battery is used.

The skis are each shod with three strips of sleigh shoe steel bolted to the underside. The spiral springs are bumpers from old cars. These carry a strip made from the same material as the skis themselves. The rear strips are hinged at the front to the ski while on the front skis the hinges are at the rear. They are kept in line with the skis by the hinged device shown. What looks like a brace to this hinge in the cut is a spiral spring which pulls the centre of the hinge backward as it works up and down during travel. The brakes are operated by a foot pedal which actuates a brake dog on both rear skis.

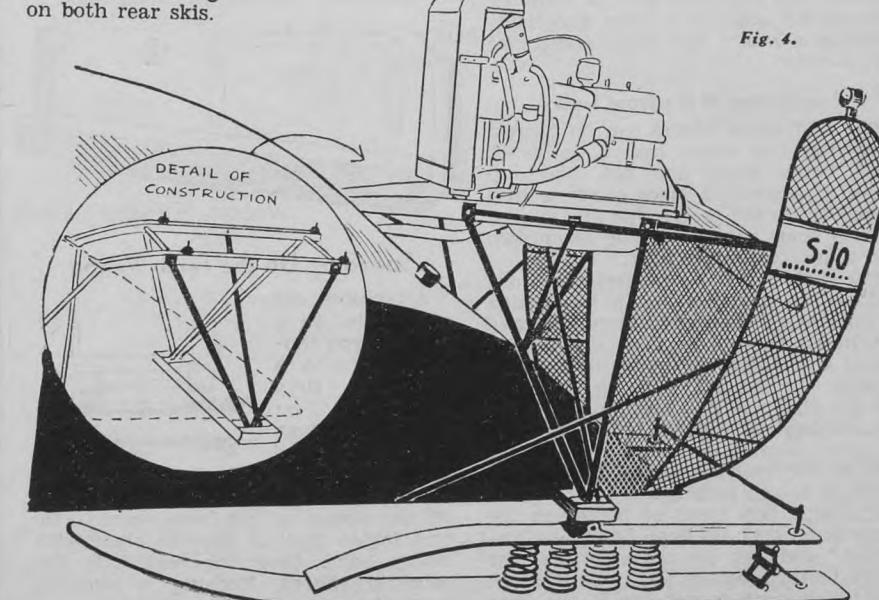


Fig. 4.

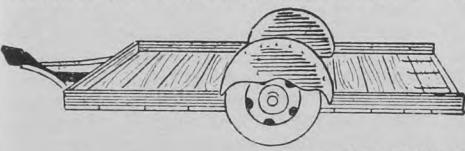
Heavy Two-wheel Trailer

A subscriber recently asked for plans and directions for building a two-wheel trailer capable of hauling three-fourths of a ton of hay. We built such a trailer and we find it very useful even behind a car, as it will not whip from side to side at high speeds.

The materials needed are the rear axle and wheels from an old car, two 14-foot 4x4's, two bolsters from an old wagon, a 4x4 about 8 feet long for a hitch, and a few bolts and clamps to hold it together. We took the springs off and clamped the timbers directly on the rear axle so as to make it lower and to avoid pitching and swaying. The axle is put about 14 inches back of the middle of the long timber so as to put part of the load weight on the rear wheels of the car to increase traction. The 14-foot timbers are tapered to fit on each side of hitch 4x4, and the front bolster is also fastened rigidly to the rear end of the hitch timber as well as to the 14-foot stringers. Any heavy trailer hitch can be used, provided the connection is secure and the pull is thrown on the car frame rather than on the bumper. We use either a 14-foot hay rack or a regular wagon box, and the trailer is strong enough easily to hold 50 to 60 bushels of wheat.—I.W.D.

Platform Truck Trailer

This low platform truck trailer is especially handy around the motorized farm. The platform is nine feet square, rides on truck wheels bought at an auction sale. The platform rides only ten inches above the ground and it is therefore easy to get plows, discs and other field machines upon it for transportation to and from the machinery shed. Planks form the bottom, 2x4's the sides



and ends. A square pipe, well braced is attached to the front. It has been flattened and drilled to connect behind the tractor or farm truck.—Dale Van Horn.

Low-down Rubber-tired Wagon

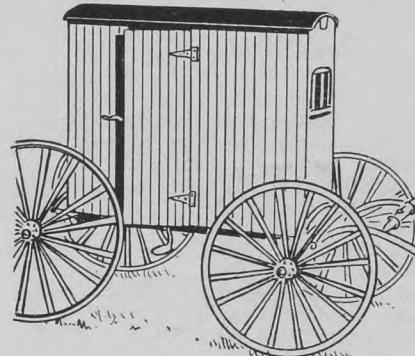
Saw the spokes off flush with the hubs. Take some old 32 by 6 inch 10-ply truck tires, and cut the beads off and then cut the tires across. Spike one end of the tire strip to the hub and keep spiking it around until you reach the starting end, and then cut it off. I put two layers on each hub, which gives me a little more clearance, a reasonable amount of cushion, and a lighter draft.



Three layers could be used, if well spiked into the hub. This makes an ideal low load wagon, with about 6-inch axle clearance and about 20 inches height.

School Bus on Buggy Chassis

For 17 years this farm enclosed vehicle has carried boys and girls back and forth from school. For 17 years, too, the faithful horse pulled the load until,



at 31 years of age, he died. The point of interest about this snug bus, however, is its construction. With seats along three sides and planned for four in comfort, it has actually carried 11 pupils on bad days. The window in front is hinged at the top so the lines may be thrust through when nearly closed.—Dale Van Horn.

SECTION 7

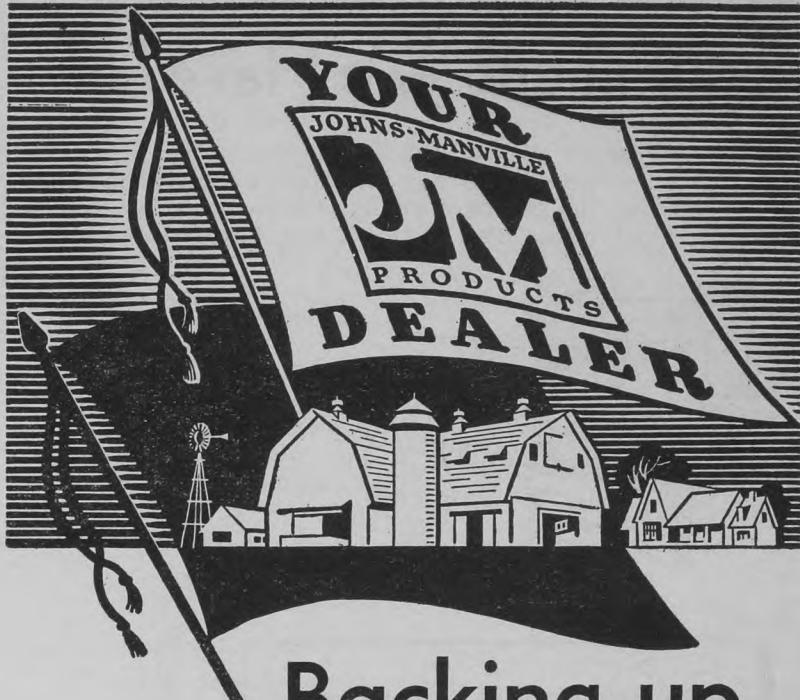
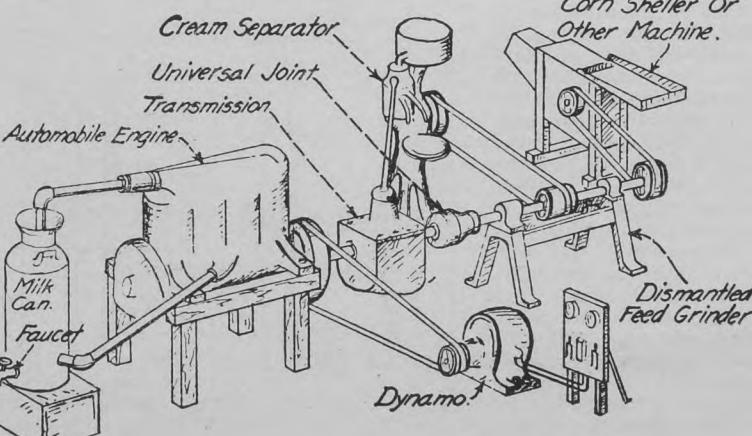
Power from Automobile Engines

Stationary Power Plant

Old Ford engines are widely used for providing stationary power. The illustration shows how the assembly may be made. It can be mounted on the original chassis with the radiator and fan belt in place to give better cooling. The clutch unit should be left in place to facilitate starting and changing speeds. A governor should be provided in case of variable load. Thus a cordwood saw with the throttle opened wide enough to cut through the log, without a governor, the engine would run away when the log was cut off and might easily burst the saw or balance wheel and perhaps kill the operator. A simple and effective governor can be secured, at a reasonable price, ready to attach. For extra

cooling a common way of adding an extra barrel of water supply is to cut the hose connections leading from the engine to the radiator and insert a tee of the proper size and from the side opening of the tee connect pipes or hose connections to a barrel set close beside the engine. Some solder a hose connection to the radiator cap and connect to near the top of the barrel and then plug the radiator overflow, with the barrel placed as high or higher than the radiator.

Most four-cylinder auto engines will not run smoothly below 800 r.p.m., which usually means a road speed of 20 miles per hour, and at this speed will not have more than one-third to one-half their maximum power. Hence it will be necessary to figure the pulley sizes for



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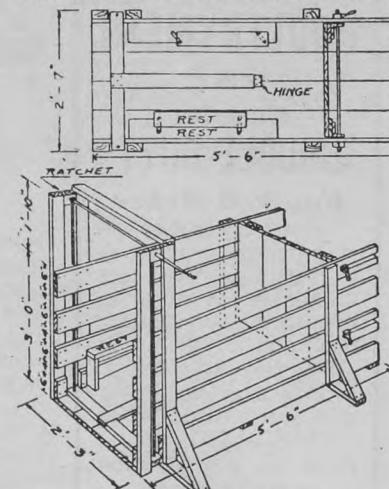
Cecum, round and tape worms must be expelled with three different drugs, acting at intervals. Pratts N.K. Worm Capsules, by their "split-action," release these three drugs into the intestines successively. ONE capsule in ONE dose worms thoroughly. Order from your dealer—or write for folder to—

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Pratts, "SPLIT-ACTION"
WORM CAPSULES

Hog Breeding Rack

With this simple and convenient breeding rack the sow is driven into the open end of the crate until her hind feet are in front of the crosspiece of the T-shaped lift, which elevates her to the desired height by means of the windlass. A ratchet on the windlass holds the lift at the desired height. The partition at



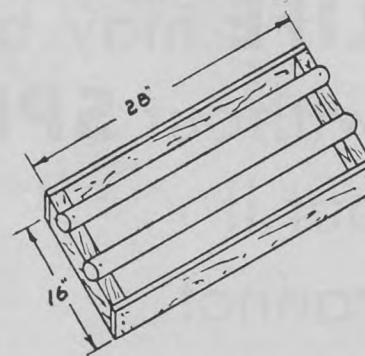
the front is adjustable to sows of different size. The boar's front feet should rest on the side rests, and a cleated board should be provided for his hind feet.—I.W.D.

Hog Catcher

For catching and holding hogs by the nose for ringing take a length of three-quarter inch pipe about three feet long, drill a hole about one-half inch from the bottom end, fasten a clothesline wire in this hole and then run it through the pipe with a loop projecting at the bottom and a short stick at the other end. Slip the loop over a hog's nose and draw up on the loop and you will have no trouble in holding him while another person puts in the rings.—I.W.D.

Keeping Cows From Gutter

Many times we find dairy cows that show a tendency to stand in the gutter with their hind feet. The diagram shows



a satisfactory remedy. A frame should be made of rough 2x4's so as to fit the gutter loosely in width and extending nearly across the stall. The cross pieces should be notched on top so that the stout round pieces can be half mortised in and then fastened firmly. When this is placed in the gutter and the cow stands on it, she finds it so uncomfortable that she will step forward where she belongs.—I.W.D.

Calf Weaner

From an old car, we got a sheet of strong sheet metal from which we cut a strip nine inches by ten inches. The strip was bent to fit the calf's muzzle. Holes were punched in the tin, with the jagged ends outward, to help the calf breathe and to make it uncomfortable for the mother when it tries to suck. The weaner extends about two inches past the calf's mouth. It is best suited to big, strong calves. This is simply a new use for the old Model T.—Wilfred Brewer, Ashville, Man.

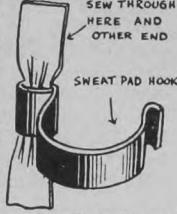
Curing a Chicken-Eating Hog

Here is a brand new use for an electric fence. If you have a hog that has a taste for young chickens you can cure him of it. Take a dead chicken, place it on a block of wood off the ground and wire it to the fence. When the hog touches the chicken he will get an electric shock and after that he will be too scared of a chicken to go near it.

Re-attaching Sweat Pad Hooks

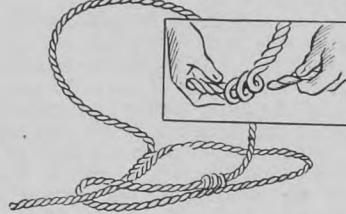
Long before a sweat pad has ceased to be useful most of the hooks come off. The salt from the perspiration attacks the wire fastening, causing it to rust and in turn the cloth is greatly weakened.

To re-attach, remove old wire staple with pliers and then cut a piece of soft leather two inches long by one-half inch wide. Roll it and push it through loop end of hook. Then flatten out ends and sew to sweat pad in a fresh place with hemp or other strong thread. The hook will now hold on longer than with its original fastening.—Robert J. Roder, Reist, Alta.



A Good Rope Halter

The figure shows an easy-to-make rope halter that can be adjusted in size to fit everything from a young

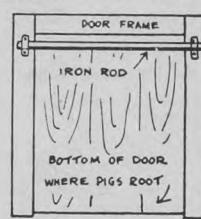


calf to a large draft horse. Bind both ends of the rope, use a punch or other pointed object to form loops in the strands of the rope as shown in the detail and run the rope through the loops. Stores handling rope will find this halter has sales possibilities.

Hog Pen Door

Many farmers have difficulty in securing a suitable door for the pig pen. Here is a simple construction that solved that difficulty for me.

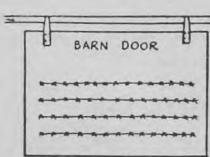
Hang the door on a rod so that it will swing both in and out. The hogs simply root the door and it will swing either way to let them in or out, as they wish.



Donald Gordon, Asquith, Sask.

Protecting Stable Door

I am submitting this idea in the hope that it may be of benefit to someone.



String three or four strands of barb wire on the sliding door of the stable. It will prevent horses which are running loose from rubbing their rumps on the door when their tails are itchy. It is a sure cure. I have it installed on my door and it is 100 per cent efficient. Horses often break doors by this habit.—M. R. Wenner, Roblin, Man.

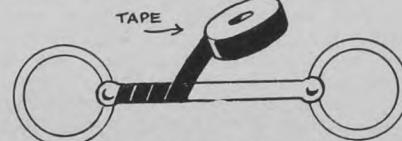
Taming a Cow's Tail

The unpleasantness of being walked about the head and face by a cow's tail while milking is in progress may be easily averted by throwing a loop of heavy rope over the cow's hips and tail as shown in the illustration.—Herbert Ratzlaff, Waldheim, Sask.



Preventing Frosty Bit

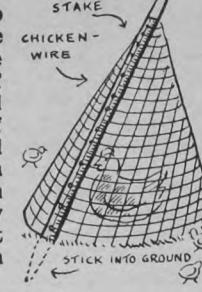
I am sending you what I consider a very necessary and humane idea for preventing a bit from becoming frosty.



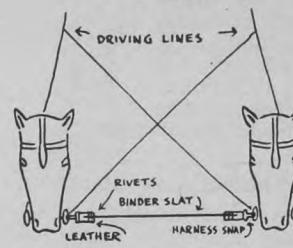
Just wrap tape around the bit from end to end and the horse will thank you kindly every time the bit is put in his mouth. The tape wrapping will last almost indefinitely.—H. R. Hinchliff.

Chicken Teepee

A portable teepee that is easy to move can be made from a sharp stake and a piece of chicken wire rolled into the shape of a cone and nailed to the stake, which is driven in at an angle. It is an easy matter to move it to a clean place in the yard.—A.S.W.



Bridle Spreader



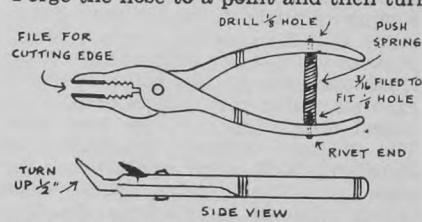
It is a bad business, and one that causes annoyance to the teamster, when one of his horses insists on biting the other. Here is a simple and effective means of preventing it. Take an old binder canvas slat and rivet a snap on each end of it and fasten it to the bits of the horses. The biter will stay put.—Tony Drewniak, Tolstoi, Man.

Keeping Lines from under Tongue

A chain hung from the front end of the tongue of the wagon or field implement will prevent the lines or bridle rein from catching under the tongue as the horses swing their heads to fight flies.—I.W.D.

Black-Tooth Clipper

A black-tooth clipper is easily made from a pair of narrow nosed pliers. Forge the nose to a point and then turn



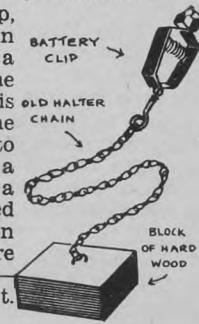
up as indicated in the sketch. It does a quick and excellent job with no difficulty. Just take the young pigs when they are a few days old and insert to take two teeth at a time. With the black teeth removed the young pigs do not injure the sow's teats when fighting for their own property—Ludwig Blaskin, Foisy, Alta.

Tether for Livestock

A good way to tether a cow is to mash or plug the lower ends of 18 or 20 inches of 1/2-inch pipe, and drive them into the ground far enough so that they will be out of the way. Then to the end of the picket chain or rope attach a 3/8-inch or 7-16-inch bolt. The bolt is dropped into the pipe, through a link of the chain if a chain is used. A swivel or two in the chain will prevent twisting.

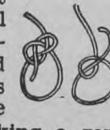
For A Non-stop Switcher

An old battery clip, a piece of halter chain or small rope and a block of wood are the main features of this cow tail holder. The chain is attached to the block with a staple and the clip, a large one, is snapped to a bunch of hair on the cow's tail before beginning to milk.—Paul Tremblay, St. Paul, Alta.

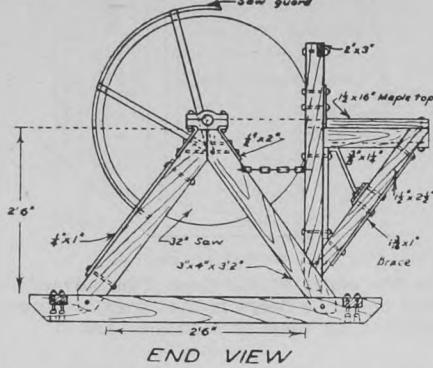
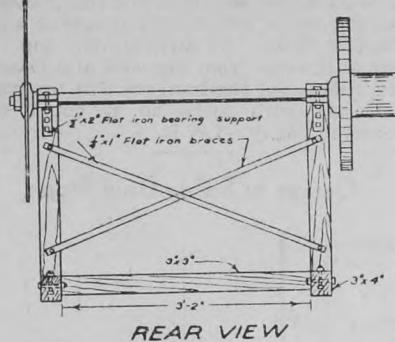


Non-slip Knot

When tying livestock by the neck with a rope, it is rather important to avoid having a slip-knot since otherwise the animal may hang itself. The execution can be prevented by making the knot as shown at right. The same knot can be used for making a rope halter for a cow or horse.



Homemade Tilting Buzz Saw Frame



Prof. L. G. Heimpel, of Macdonald College, Que., designed this tilting saw table. These views of it are given from his drawings. They make it self-explanatory. The sills are 3x4, or could be made of 4x4, and are securely framed. The uprights are of the same dimensions. A

saw guard is provided and this should not be overlooked, as a whirling saw can be an instrument of destruction and proper precautions should always be taken with dangerous machinery. A 32-inch saw is recommended.

Points Concerning a Home-made Sawmill

This sketch shows the construction of a home-made sawmill erected by James Anderson, of Hamiota. They indicate sufficiently how a sawmill of this kind can be constructed at little cost. Of course, to build and run such a piece of machinery requires a man of some mechanical aptitude. There are just a few points, however, which should be remembered. They are suggested by Prof. L. G. Heimpel, of Macdonald College.

Set the saw plumb and true. Set the saw guide and adjust the guide pins clear of the teeth and just touching the blade. This should be done while the saw is in motion, care being taken that the pins do not push the saw to one side or rub hard enough to cause friction. After screwing the saw up between the collars, examine the front or log side of the saw to make sure that it is flat.

If the saw is found to be rounding on the log side, cut a ring of paper about half an inch wide the size of the collar on the outside, oil it and stick it on the face of the tight collar around the outer edge. Then cut another ring of paper the same width, make the hole the same size as the hole in the saw and put this small ring between the loose collar and the saw and screw up the collar. If the two rings are not enough put in more until the saw stands straight and true. If the saw hangs dishing on the log side reverse the rings of paper.

If the saw blade heats in the centre when the mandrel runs cool in the box, cool it off and give it a little more lead into the log. If the saw heats in the ring and not in the centre, cool it off and give it a little more lead out of the log.

A saw should have a lead into the log of $\frac{1}{8}$ of an inch in 20 feet. To give it this lead, move the carriage forward until the rear head block is opposite the saw. Fasten a stick on the block so that the end or point of the stick is set $\frac{1}{8}$ of an inch from the saw. Now run the carriage back 20 feet from the centre of the saw. Stretch a line from the end of the

stick along the face of the saw so that it touches the saw on both edges. If it does not touch the saw on both edges adjust the main mandrel box by the set screws on each side until it does.

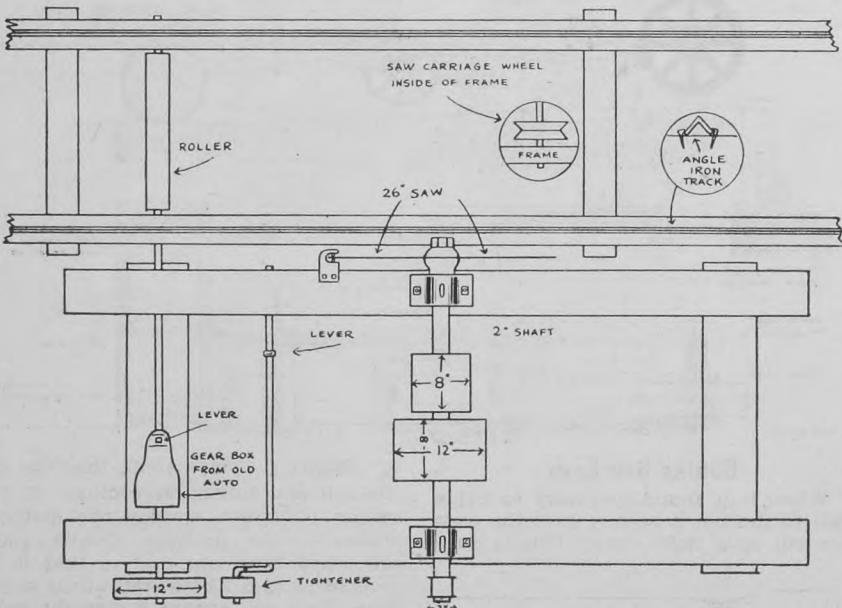
The guide block and pins must be given special attention. They should support the blade above the centre of the saw because the upper half of the saw does all the work. Guide pins should be made of hard end wood. They are set to clear the bottom of the sockets of the teeth by about $\frac{1}{4}$ inch.

The size of the saw should be governed by the size of the logs to be cut, regardless of the amount of power used. The diameter of the saw should be approximately one and a half times the diameter of the largest log to be cut. Manufacturers give the maximum speed at which their saws should be run but these speeds cannot be used for portable mills because of insufficient power. They are given by saw makers to show what the saw will stand and not what it is supposed to accomplish in practical work every day.

Do not file all the teeth from the same side, especially if each alternate tooth is bent for the set. File the teeth that are bent from you on the one side and leave them on a slight bevel, with the outer corners a little the longest and then reverse the saw and treat the other side in the same manner.

Saw teeth wear narrow at the extreme points, consequently they must be kept spread or wedged so that they will be widest at the very points. Never set teeth when the saw is frozen.

The greatest wear on the teeth is on the under edges. File nearly to an edge, but not quite, leaving a short bevel $\frac{1}{32}$ of an inch wide on the underside of the point. But in no case file to a point or thin wire edge. Do nearly all the filing on the underside of the teeth and see that they are all wedged at the points. File square across and see that they are all given an equal amount of set.



Sketch of the main features of Mr. Anderson's home-made sawmill.

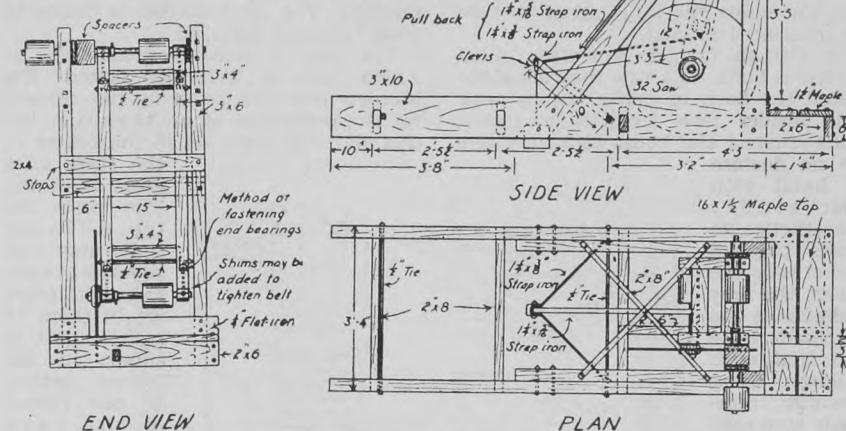
Plan of Swing Saw

When heavy logs are being sawn, a swing saw can be used to advantage, because the logs are in a stationary position while they are being cut. In using the swing saw, one end of the log is placed on the saw table and the other end of the log is placed on a trestle which is the same height as the saw table.

Where a portable sawing device is desired, the swing saw unit is usually mounted on a low wagon gear. For stationary work the saw frame is blocked up so that the saw table is about 30 inches from the ground.

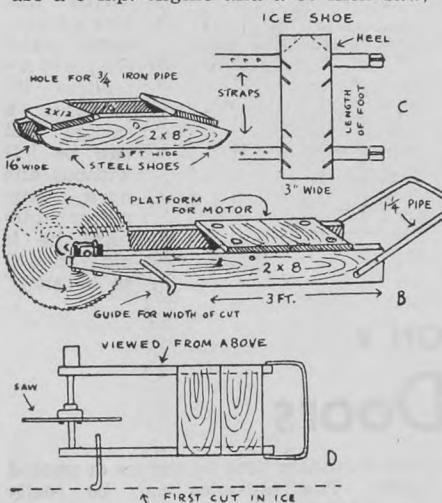
In constructing the sawing unit, all parts of the frame should be well braced and rigidly constructed. The pull back

device consisting of a tie strap, a $1\frac{1}{4}$ -inch by $\frac{3}{8}$ -inch strap iron hinge, and a weight, is designed to hold the saw back firmly and to reduce pull as the saw is drawn through the log. A suitable weight can be selected for the pull back device and it must be securely attached to the tie strap and hinge.—W. Kalbfleisch.



An Ice Saw

I have used this ice saw for 11 years and it has given entire satisfaction. I use a 3-h.p. engine and a 30-inch saw,



and can cut 12 inches deep. I used an old brake drum out of a model T Ford car for bolting the saw to, using two $\frac{3}{8}$ -inch bolts which go through the saw and collar. The holes in the platform on which the motor is set has oblong holes so that the motor can be slid backward for tightening the belt. This assembly is mounted on the sled, shown at the top left. The weight is carried by a piece of $\frac{3}{4}$ -inch iron pipe which passes through the holes in the runners of the sled and in the side

pieces of the part carrying the saw. This allows you to tilt the saw up and down, according to the depth you want to cut. You go backwards while pulling the saw. Ice shoes can be made from flat iron, with slits cut in at an angle of $\frac{3}{4}$ -inch and the points turned down for spikes.

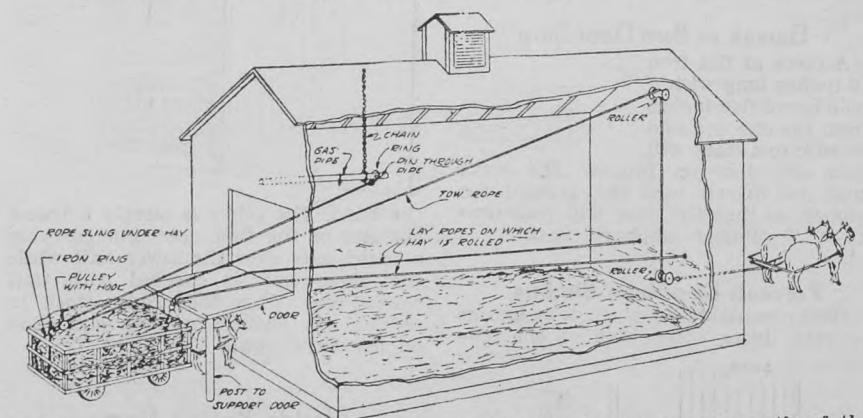
I cut the ice both ways and then cut about every five cuts with a cross-cut saw and split the balance out with a bar. The blade of the bar is two or three inches wide and tapered from half-an-inch thick at the top to a thin edge. It is the wedging that splits the ice.—Lee Bussard, Wetaskiwin, Alta.

Home-Made Saw Frame

The sketch shows a steel pole saw frame with a swinging table which works very well. The frame is made of 2×2 inch steel $\frac{1}{4}$ hole angle iron taken from an old seed drill. The table is made of $1\frac{1}{2} \times 1\frac{1}{2}$ inch angle iron taken from an old binder. The hooks are $2 \times \frac{1}{2}$ -inch flat steel. The hooks should be made according to the size of blade used. For a 24-inch blade the hooks should be about 11 inches. The base is an old car frame about five feet long. The mandrel is made from an old drive shaft taken from an old Chevrolet car. The frame stands 6 ft. 6 in. high and is about 3 ft. 6 in. wide.

SECTION 11

Derricks, Hoists, Presses



This is a diagram of a hay unloader developed by a farm manager south of the line. It rolls the load off at one operation. The ring on the end of the tow rope presses against a pin in the gas pipe and slips off when the pulley with hook reaches it. Usually in this country the team on the wagon would be standing just inside the stable door.

Says Mr. Gold Seal



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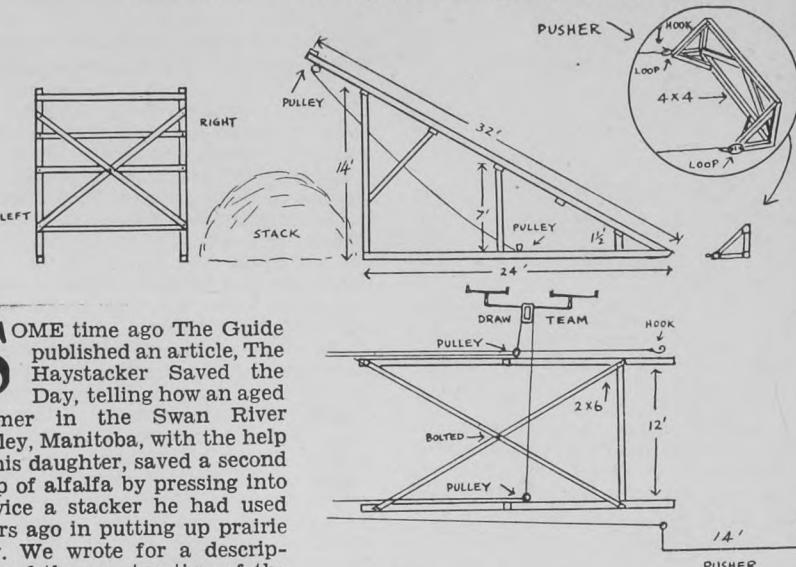
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Instructions for Making a Haystacker

This one saved the day in a tight pinch last fall



Some time ago The Guide published an article, The Haystacker Saved the Day, telling how an aged farmer in the Swan River Valley, Manitoba, with the help of his daughter, saved a second crop of alfalfa by pressing into service a stacker he had used years ago in putting up prairie hay. We wrote for a description of the construction of the haystack and received in reply full information from Fay A. Stewart, the lady who helped out in the emergency, together with drawings and bills of material used.

The base of this haystack is a pair of timbers 6 or 8 by 12, and 24 feet long. Logs would do where they are available. They are held apart in front by a cross piece 4x4 and 12 feet long. There is no cross piece between them at the back or stack end as it would interfere with the stack. They are braced with two diagonal pieces of strong 2x6 stuff, bolted to the runners at each end and to each other in the middle as shown in the diagram.

The next step in the construction is the frame work at the rear or stack end. The upright posts are two pieces of 4x4, 14 feet high. Three or four crosspieces are bolted on as shown. For these, 2x6 scantling, 12 feet long, are used. They are braced diagonally with two 2x6 scantling 16 feet long. The pieces are thoroughly bolted to the uprights and bolted or nailed together where they intersect as this adds to the rigidity of the frame.

Now take the side view, shown in the diagram. A pair of centre posts is provided, with a cross piece across the top, to support the slide up which the hay is drawn. These posts are seven feet high. It would be well to brace these also. Near the front there is also a pair of short posts, 18 inches high, of 4x4 stuff, with a crosspiece. This crosspiece carries the lower ends of the floor boards and the upper edge of the folding apron, which is described below. There is also a brace from each end post to the crosspiece which is located on the frame as shown. Note by the photograph that these two braces meet at the upper end in the middle of the crosspiece. This gives greater rigidity to the frame.

The main timbers of the sloping slide, which carry the load, are 32 feet long and should be 6x6 at least. Between them are the five crosspieces to carry the floor. These are 12 feet long and are bolted on under the timbers so that the timbers form sides for the slide. At the top of the sloping timbers a 2x6 crosspiece is firmly bolted across the top. It projects out on the side on which the horses pull. To it are attached the two top pulleys, the one on the projection



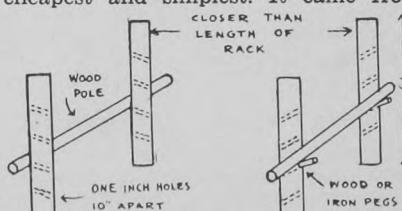
pusher with a wire loop. The shorter one is 68 feet long, carries a hook at the bottom, so that it can be detached from the pusher. When the pusher is empty the rope is unhooked from it and it is swung to the side out of the way of the sweep.

The ropes are carried from the pusher up through the pulleys attached to the top crosspiece. The long one is on top of the frame and the short one, on the pulling side, is clear of the frame. This allows the ropes to come down to the lower pair of pulleys clear of the frame work.

The sweep of hay is swept up on to the apron. The pusher is swung around behind it. The go-ahead signal is given. The team moves away sideways from the stacker. The load is pulled up the slide and dumped on the stack.

Lift for Hay Rack

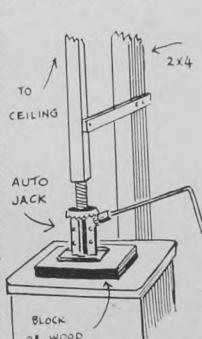
Many designs for one-man rack lifters have been sent in. This one may not be the quickest to operate but it is the cheapest and simplest. It came from



a Saskatchewan farmer. All that is needed is four posts, about six inches in diameter and seven or eight feet long, and two 15-foot poles. Holes about 10 inches apart are bored in the posts at an angle. Bolts or hardwood pins may be used to support the poles. One corner is lifted at a time. It can also be used for lifting a wagon box.

Auto Jack for Screw Press

This shows how I used an ordinary screw type auto jack to secure the necessary pressure to glue a stiffening rib on the under side of a small table top. It can be used for almost any kind of glue work where pressure is required and also for pressing cheese, lard, etc.—I.W.D.

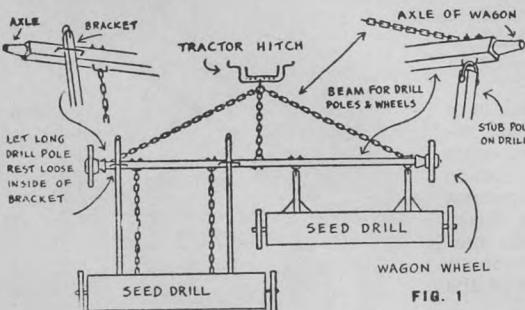


THE response to the request of The Guide for designs of homemade hitches for linking up two or more horse-drawn machines behind a tractor was generous. Many sketches with explanations were received and four of them, of particular value at this season, are published herewith. They have all been put to the test of practical use in the field and have given satisfaction. Other designs will be published in due course, including several binder hitches.

Two-Drill Hitch

Take two wagon wheels and a piece of timber wide enough for two drills (fig. 1). Then bolt the axles of a wagon to each end of the long pole or timber and put on the two wagon wheels. If you have not as many chains as are shown in the sketch you can use a long iron rod with a few links in each end so that the rod will not break.

If you want to haul three drills, have the long timber one-third as long again and hitch the third drill on the left side using long tongues, while the drill



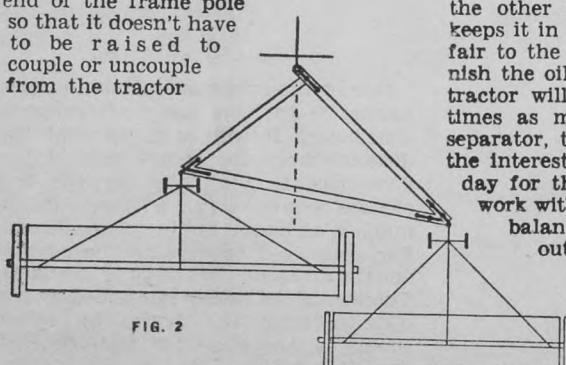
with the stub tongues is hitched in the centre. In that case the long timber would have to be strengthened.—J. M. Holman, Lougheed, Alta.

For 28 and 20-Run Drills

This is a hitch (fig. 2) that we have used for several years with complete satisfaction. Our drills are 28 and 20-run and once when seeding breaking we adjusted an ordinary chain from the tractor draw bar to the frame of the front drill to steady it. They can be hitched very close as the wheels may rub the frame or running board on the corners without doing the slightest harm. The hitch is made of 4x6 beams joined by $\frac{1}{2} \times 3$ -inch irons. — Harvey Bros., Flaxcombe, Sask.

Frame Tractor Hitch

Here is a sketch of a frame tractor hitch I have found to be quite satisfactory and simple to make (fig. 3). No wheels are necessary, but with a little alteration it could be changed into a truck with the addition of two wheels if desired. As shown, the frame work is composed of four 2x6's 14 feet long for crosspieces and pieces of 4x6 each two feet long for the ends. The short pole is a five-foot 4x6, and the braces are two pieces of angle-iron each eight feet nine inches long. The machines are hitched to the frame by means of king bolts on which the tongues pivot. The poles slide between the two rear 2x6's when turning. The frame is attached to the tractor draw-bar by means of a ring and two clevises. An iron step or leg is fastened underneath the front end of the frame pole so that it doesn't have to be raised to couple or uncouple from the tractor.



draw-bar. This leg should be about eight inches long.—J. R. Duncan, McKenzie Island, Ont.

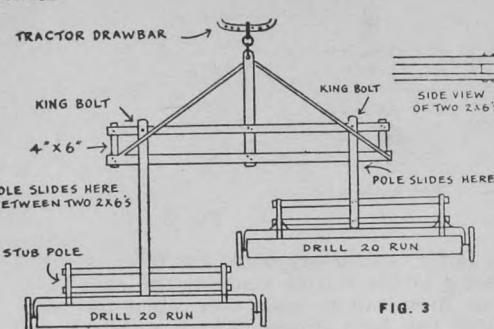


FIG. 3

Drill After Tiller

The accompanying diagram (fig. 4) shows a very successful hitch for drawing a drill after a tiller. The drill is hitched behind the tiller as closely as it will work. Use a stub tongue in the drill about two or three feet long. On top of this put a 2x4 hardwood tongue (birch will do) that reaches to the frame of the tiller. Put a bolt through the 2x4 and the stub tongue so as to form a pivot that will turn easily. Fasten a U-shaped iron over the 2x4 to the frame of the tiller so that it will allow the 2x4 to slide freely. Hook a cable from the left corner of the drill frame to the right corner of the tiller frame and another from the right corner of the drill frame to the left corner of the tiller. The drill will then make short corners. The drill we used is the same width as the tiller. We used this hitch last year and it worked perfectly.

The diagram shows how the hitch is applied and from it any farmer will know just how to go about making it. Very little new material is required for mak-

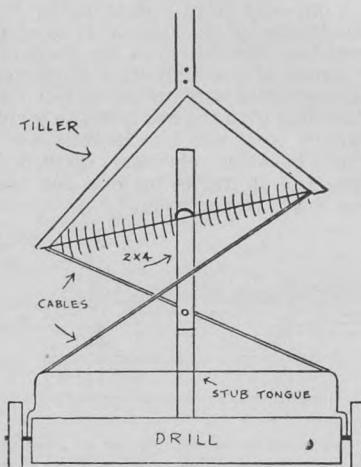


FIG. 4

ing the hook-up.—Carl A. Tatroe, Sedgewick, Alta.

Cost of Tractor and Separator

In the operation of a small threshing outfit, it will generally be found that the cost per day for a small separator will just about balance the cost of the tractor plus the cost of the fuel and oil.

Thus it would be just about right for one partner to furnish the tractor with the repairs, oil, and fuel included; while the other furnishes the thresher and keeps it in repair. This might seem unfair to the tractor to require it to furnish the oil and fuel, but generally the tractor will be used from two to four times as many days per year as the separator, thus decreasing very greatly the interest and depreciation costs per day for the tractor. If both partners work with the outfit, these would also balance. If only one goes with the outfit, he should be paid an agreed wage per day, and this taken off before the remaining income is divided equally.—I.W.D.

Four, Five, Six and Eight-Horse Hitches

How to make eveners for moderate-sized outfits

THE four-horse hitch shown in fig. 1 is for a 14 or 16-inch sulky plow, with the teams strung out tandem. The hitch is in the true centre of the draft, eliminating side draft on the plow and reducing the power required. A 42-inch wagon

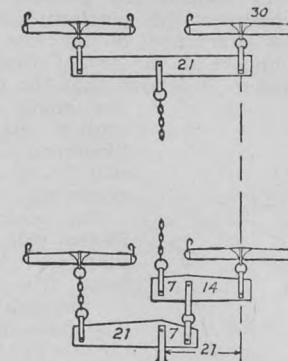


FIG. 1

Here, in fig. 5, is an arrangement for stringing three teams out tandem. The front evener is an ordinary one. Working back the next one is 22 1/2 inches

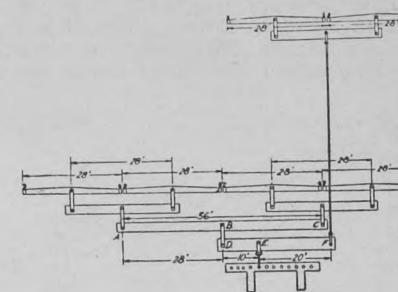


FIG. 5

long, divided 7 1/2 and 15 inches, with one horse pulling against two. On the next one, three horses pull against one and the division is 7 1/2 and 22 1/2 inches. Then these four pull against one with the next evener, 4 1/2 and 18 inches. Finally the five pull against the sixth.

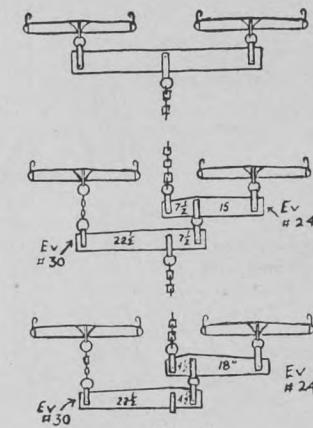


FIG. 5

evener is used in the lead and the chain is long enough so that the wheel team will not bump their knees on the lead evener. The hitch works equally well on a wagon and can be used on a binder. On the wagon, buckstraps and tie chains should not be used. Use lines on both lead and wheel teams.

Fig. 2 shows how to make a simple five-horse abreast evener. The main evener is 78 inches between clevis holes. To it are hitched two eveners 45 inches long, divided nine inches and 36 inches since the middle horse has to pull against the other four. A space of six inches is left between these two eveners. The iron rods are made long to bring the middle horse as far forward as the others.

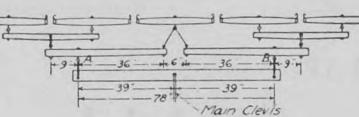


FIG. 2

A five-horse tandem evener is shown in fig. 3. The rear evener is divided six and nine inches, as shown at A, since the lead team pulls against the other three horses. The middle horse of the wheel three pulls against the two outside wheel horses. To equalize the draft between these three horses two pairs of steel bars are bolted on the wooden evener at the outer end as shown at B, but left to swing freely. The division of the bars is nine and 18 inches. The rear whiffletrees are 28 inches long and the front ones 30 inches. The evener for the lead team C, is 36 inches long. The cable or chain, D, is just long enough to prevent interference.

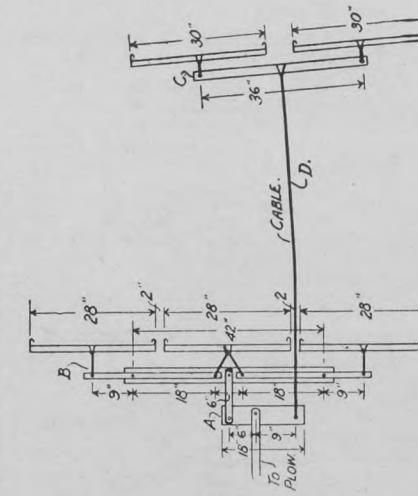


FIG. 3

In the six-horse tandem evener, fig. 4, the long evener, A-C, is 56 inches between clevis holes and is divided evenly, with B in the exact middle. The rear evener, E, is 30 inches long, divided 10 and 20. The singletrees are all 28 inches long, and the doubletrees the same length, 28 inches.

which is given an advantage of 22 1/2 inches to 4 1/2 inches. The advantages of tandem hitches are that they are cooler on the horses and side draft is not a problem.

Finally we have an eight-horse hitch in fig. 6, where the horses are arranged four and four. There is little side draft and only one chain or cable is required. Note, where the main hitch is connected with the plow, that short chains making a crotch extend back to small clevises to facilitate turning the plow at

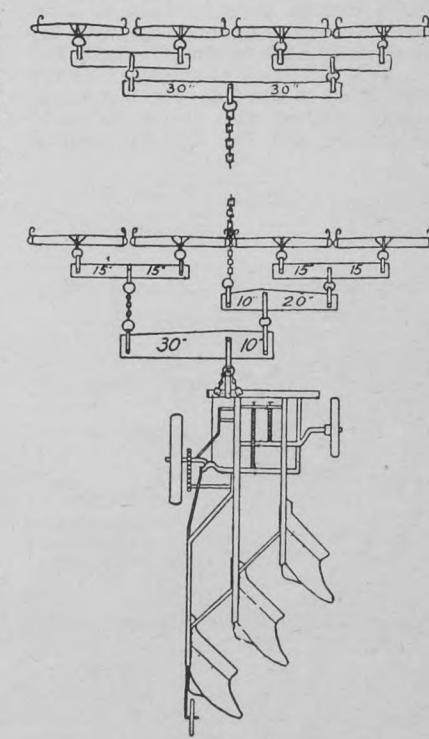


FIG. 6

the corners. The lines go to the lead horses but a short strap is attached from the bits of the two outside rear horses to the lines. Lead lines extend from the bits of the rear horses to the singletrees of the lead horses. The lengths used in making the eveners are all shown clearly in the illustration.

Tandem Plow Hitch

Someone asked for a hitch for hauling a two-furrow plow behind a three-furrow tractor plow. I have used these implements by attaching a cable or long chain from the left-hand side of the tractor draw bar through a ring wired to the left beam of the three-furrow plow, through a clevis bolted to the tongue of the two-furrow plow and through to the draw clevis of the second plow. If it is desired to hitch the two-furrow plow up closer to the three-furrow plow, discard the wood tongue and make a V-shaped devise from angle iron to haul and guide the two-furrow plow. If both plows are the power-lift type the usual turns can be made on the headlands. Otherwise it will not be possible to make short turns at the ends of the fields.—T.N.S., Cadogan, Alta.

Steers from Chain

This tractor hitch for two binders takes only a few pieces of flat iron and a 14-foot logging chain. The diagram shows how it is attached to a McCormick-Deering tractor, but of course it can be hitched after other makes.

A crossbar is bolted to the drawbar of the tractor behind the differential. This crossbar is drilled in the centre and a stout piece of flat iron about three feet long is drilled and bolted to the crossbar and the side hole in the tractor drawbar. This being on an angle will enable the tractor to follow the grainside while the first binder takes the full swath.

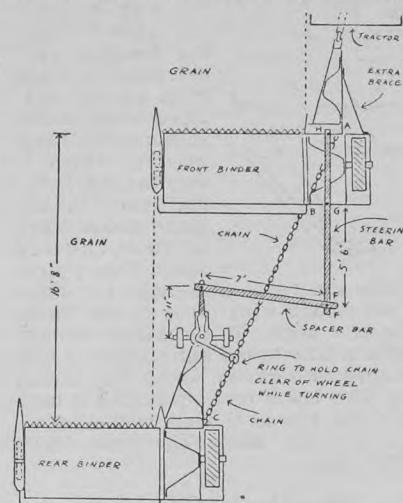
In place of the tongue in the first binder a stub pole about two feet long, with flat clevises on the end for hitching to the tractor, replaces it.

The second binder also has a two-foot stub tongue. The hitch for the horses is left on this binder; only the eveners removed. A logging chain at least 14-feet long is attached in place

Using Steering and Spreading Bars

When two binders are hitched behind a tractor there is considerable side draft. Do not expect too much from a homemade hitch in keeping the corners square. They should be made somewhat round.

The hitch on the first binder must be well braced as it has to pull the second binder. It is advisable to take the truck off the first binder as it simplifies turn-



ing the corners. The rear binder is drawn by a chain or cable which is fastened to the front binder at A. The chain passes under the frame and almost directly under the sprocket which drives the canvas. It is held down by a block so it will not interfere with the sprocket and should be held in place by a ring or wire loop at B, to prevent it swinging at the corners. It is fastened to the rear binder frame approximately at C. The entire length of the chain is nearly 18 feet when the binders are spaced properly.

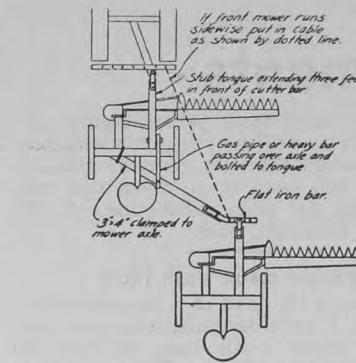
The success of the hitch depends on getting the binders spaced properly and on having the steering bars the right length. The length is given at GF. The length of the spacer bar must be adjusted to have the rear binder cut nearly the full swath. It is about seven feet long. The length of the spacer bar will vary according to the angle the trucks make when turning. This varies with different makes of binders.

The spacer arm hinges at both ends, where it is fastened to the steering bar and to the stub tongue of the rear binder truck. The steering bar can be clamped to the frame of the front binder with U-bolts at H and G. A straight grained 4x4, or a strong piece of angle iron will serve for steering and for spacer bars.

Occasionally it is necessary to weight the rear binder truck with sand bags.—Orval Hesla, Lajord, Sask.

Two Mowers Behind Tractor

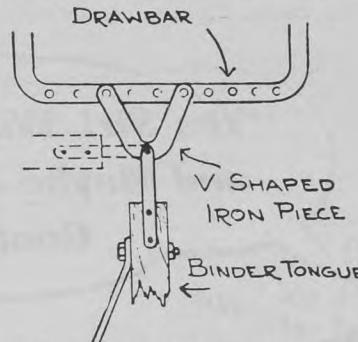
This illustration shows a simple hitch for drawing two mowers. A hard-wood scantling, 3x4, is clamped to the front mower. A fir 4x4 would do as well. On the end of it a flat iron bar



carries the stub tongue of the rear mower. An iron bar, passing over the axle, is bolted to the tongue and to the scantling to hold it up. The stub tongue of the front mower extends three feet in front of the cutter bar. To prevent side swing a chain or cable runs from the drawbar of the tractor to the bar which hitches to the rear mower. By placing the two mowers in their proper relative positions the length of the different parts of the hitch can be readily calculated.

Safer Binder Hitch

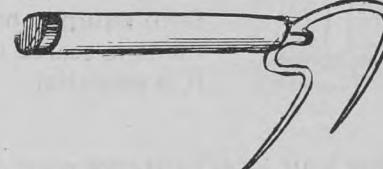
Here is a diagram of a simple attachment to the tractor drawbar for hooking up the binder, which has stopped split binder tongues for us. The V-shaped attachment shown makes



possible a sharp, right-angled turn, and a neater job of cutting the field. The attachment is made from strap iron a little lighter than the drawbar, such as a heavy wagon tire.—I.W.D.

Belgian Stooking Fork

This is a simple contrivance which saves much stooping while stooking, and is helpful particularly to old men who go out to do their bit in the harvest



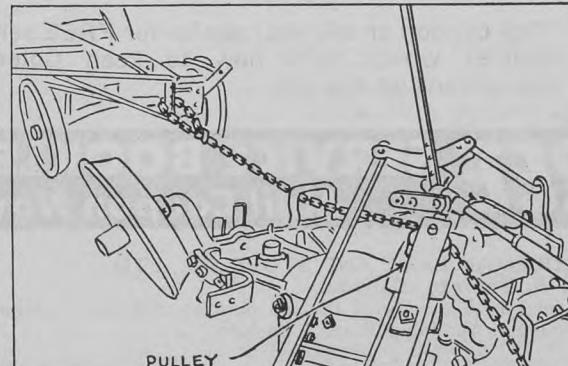
field. The middle tine is taken out of a three pronged fork and the outer two are bent to form hooks. A short handle is used. The idea came from Belgium.—Camiel De Decker, Montmartre, Sask.

One-Way Behind Binder

This illustration is from a leaflet issued by the extension department of the Manitoba department of agriculture.

It is quickly and easily constructed by extending a chain from the tractor drawbar to a point on the rear of the one-way disc that is directly in front of the stub tongue of the binder when the latter is in the correct operating position. At this point a pulley should be solidly bolted so that the chain may run on it, as it will do on the corners. Carry the chain back to the stub tongue, but first passing it through the U guide bolted on the rear of the disc frame, as shown in the picture. This guide gives more positive control on corners. The chain can be secured to the truck at the base of the stub tongue.

It might be necessary on some makes of one-way discs to raise the pulley a



standard to the frame and supporting it with braces. The pulley can be secured to the top by means of a clevis arrangement. Using this hitch it is not necessary to run the chain back through the guide, the binder following satisfactorily from the pulley.

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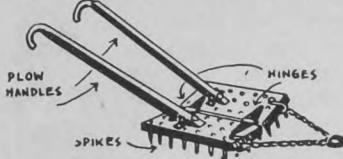
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Avoids Losses

SECTION 13

Small Implements

A Harrow For a Dollar

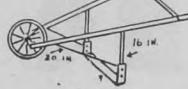
This little harrow costs but little and can be used for cultivating between the rows of garden stuff or potatoes. It could be so constructed as to straddle the rows when the stuff is small by raising the hinges with blocks. Use



four-inch spikes as they are much heavier than the 3 1/2-inch spikes generally used around the farm. Old plow or cultivator handles can be used, but if none are available they can easily be shaped out of some 2x2 stuff. The little affair will save a lot of hoeing.

A Wheel Hoe

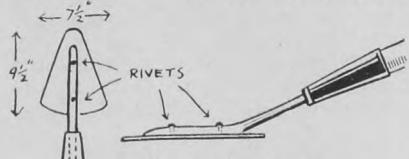
The knife of this cultivator was made from an old car spring, shaped and tempered by a blacksmith. The handles were made from 2x2 banister stock. The braces are



ordinary band iron. When laying out the garden have the rows of vegetables a little wider than the cultivator blade so that you have to go down the row only once for each cultivation.—A. T. Gossen, Hepburn, Sask.

Home-made Push Hoe

Following the lead of a Manitoba or chardist, I have designed and tried out half a dozen push hoes of various angles, shapes and sizes. The one I like best, and intend to use henceforth, is light and not too wide, quite pointed, and with strongly sloping sides, though blunt on the very tip. The long slope gives one a chance to cut through even stout weeds with little force, and the blunted end enables one to hit square-

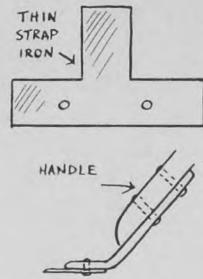


on upon a particularly stubborn plant. The metal from the feeder knives of a grain separator makes very good material for a push hoe. No trouble should be spared to obtain a good, smooth

handle, and its angle with the blade should be that best suited to the man who uses it oftenest.—Percy H. Wright, Moose Range, Sask.

Garden Time Saver

SCALLOPED BREAD KNIFE



A very convenient device for hoeing between garden plants is made from an old scalloped bread knife. It eliminates hand weeding which is very tedious. Drilling holes in the blade about three or four inches apart. Take a piece of thin strap iron and make two holes to correspond with those in the blade. Note the angle of the strap iron in diagram. The bread knife blade is now attached to a handle about four inches long. This hoe is used by moving it back and forth, just as though cutting bread, as you move along the rows.—Henry A. Jantz, Langham, Sask.

of thin strap iron and make two holes to correspond with those in the blade. Note the angle of the strap iron in diagram. The bread knife blade is now attached to a handle about four inches long. This hoe is used by moving it back and forth, just as though cutting bread, as you move along the rows.—A.P., Dallas, Man.

New Use for Old Hoe

An ordinary garden hoe which is worn out and will not work well any

more can be made into a handy hand cultivator by chiselling it into the shape indicated by the dotted lines. When the young plants are just above the ground a person can hoe them on both sides of the row and stir up the soil around and between them.—Bernard Schick, Carmel, Sask.

Improvised Garden Hoe

This is a home-made garden tool which I have proved myself to be very handy and useful, at the same time being cheap and easy to make. Take a piece of strap iron and bend it in the manner shown. Then fasten it to the handle. Sharpen the blade on both sides and work the hoe backward and forward. A big patch can be hoed in a short time.—Henry A. Jantz, Langham, Sask.

Briar Cutter

To make a briar cutter get a worn-out mower blade and cut off a length that has four sections or teeth. Rivet this to the eye of a scuffer hoe, or weld it to the blade of an old grubbing hoe. Sharpen the knives with a file or emery and you have a good tool to cut briars as well as an excellent fire-fighting tool.

Rake from Fork

Needing a rake about the workshop I got an old fork with five tines, heated the tines and bent them over in a curve so that all the points were in line. Then I found that the rake was also useful in cleaning up the yard or cleaning stables.



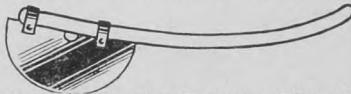
Brush Hook from Shovel

An old shovel of the round nosed type can be made into a useful brush hook for clearing land along fence rows and similar work. The blade is cut away as shown by the dotted lines and the resulting sickle is sharpened. It makes a useful tool.



Brush Axe from Rolling Coulter

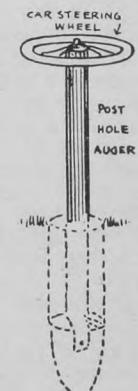
Take an old rolling coulter from a gang plow, heat it and halve it. Next drill two holes as shown in the illustration. From two pieces of 1 1/4-inch iron make two loops for the handle. Make the handle, bowed as shown, and saw a slot in it for the straight end edge of the



blade to get greater firmness. Then rivet the loops on as shown. The cutting edge of this axe, being wide and thin, cuts many kinds of brush or even small trees much better than an ordinary axe. Two or three may be cut off with a single stroke. I have used this axe myself, and a neighbor cut nearly 200 acres of brush with it.—Theodore Troitsky, Springdale, Alta.

Steering Wheel Auger

A car steering wheel placed on the common post hole digger will greatly improve it, especially when it is necessary to make a post hole near another post, as the ordinary type of handle has a tendency to get caught and often results in the injury of the operator's hands. The drawing is quite self explanatory. If the hole in the steering wheel is too big a bushing will remedy this.



Shovel from Ford Fender

That perpetual rattle from a Model T fender can be converted into a sturdy fire shovel. I think the illustration is sufficient without any instructions how to make it.—W. M. Kowalchuk.



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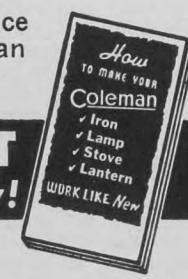
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SECTION 14

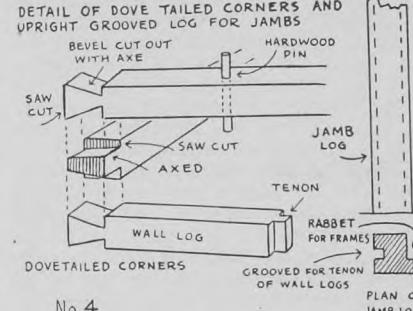
Building, Carpentry, Concrete

So many requests have come to The Guide for information on the construction of log houses and other buildings that we reproduce here-with instructions written for The Northwest Farmer some years ago by V. W. Horwood, well known authority on farm home construction.

The first thing to do after the site is picked is to get a corner. To lay the building square use the simple rule known as the 3, 4, 5 rule and by using a common multiple it can be increased to any length, say by 2—gives 6, 8, 10. At one corner of your building set a

Measure for the length of wall log and lay on the wall; on this measure for depth of jamb rabbet. Saw this piece out; put tenon into rabbet, then go to corners and mark the length and where the corners fit into under piece, saw and bevel to make dove tail. Fit this log into place. If your log is square it will rest on the lower log. If round you will use the method shown in fig. 2. Bore holes through log when in place and drive hardwood pins to hold logs. The construction of the roof with poles for rafters would be carried out by notching as in fig. 1.

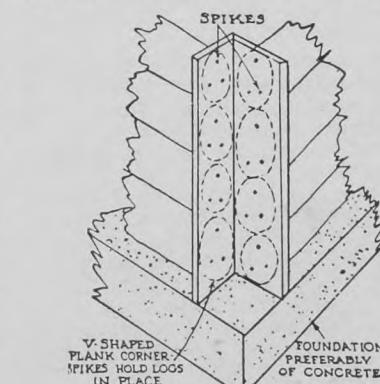
The Hudson Bay log house is another type which is more easily and quickly put up. Spike together two two-inch planks, one as wide as the diameter of the logs to be used, the other two inches wider, the planks as long as the building is to be in height from foundation to plate. Set up a pair at each corner with the point of the "V" placed so as to be exactly where the inside of the corner of the building is to be. Cut logs in exact lengths, place between the upright corners and spike through the planks into the log ends. Set up plank frames for door and window openings and spike firmly to the ends of the logs. For plate use a log or pole about four feet longer



No. 4

than the length of the building to provide for a two-foot projection at each end. Use poles for rafters. Spike a plank securely to each of the four rafters that are to hold up the gable ends. Cut end logs the proper slant and hold them in place by spiking through the plank and into the ends of the gable end logs. Roof with sheathing, shingles, or ready roofing. Floor to suit requirements. If concrete is not used for foundation, a log will serve, but concrete is best. Five or six-inch spikes are used to secure the corners. To finish off the corner, an upright log fitted into the "V" gives a better appearance but doesn't add anything to the strength of the corner. Buildings of this construction will stand for years.

The simplest type of log building is the one made of small logs or good sized poles and with notched corners. There is no trouble putting up a building of this construction except to see that the



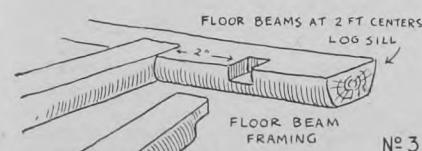
notches fit fairly snugly over the log they contact with and that the logs are laid with the notch down instead of up, this to shed rain and keep the corner from rotting. No foundation other than logs or blocks is used as a rule for buildings of this type.

For plastering a log wall use one part each of lime and sand, or one of cement to two of sand. To keep the mortar in position drive small nails into the logs at four-inch centres and staggered. Another method of keeping mortar from sliding off a log is to nail small strips, often willow limbs, on the logs just under where they meet.

other way is when heights of doors and windows are reached to make two saw cuts in the logs at the proper width to give a starter for sawing.

The trouble in log wall construction, unless the logs are squared, is to get the upper logs to fit snugly over the under log. There is a gap to be filled with plaster or moss—a poor construction. In fig. 2, is a method which gives a snug joint. When the log is notched approximately to its position lay it on the wall. A wide crack will be between the two. Take a piece of wood about the size of the crack with a pencil on top. With the piece of wood follow the top side edge of the under log on both sides. The pencil will mark the irregularities of the under log on the top one. A scribing tool like the one shown can be purchased or made. Cut to this line, adjust the log; cut out until it rests snugly over the upper log. Put moss on, making an air-tight joint.

Fig. 4 shows dove-tailed construction with jamb logs rabbeted and the logs tenoned into them. This construction can be used on a round log construction



by using the method in fig 2. The jamb logs are grooved about 3x3 inches by boring holes with an auger and chiseling between to take out rabbet. Into this the wall log is tenoned. Erect these logs.

How to Frame a Frame House

THE illustrations, figs. 1, 2 and 3, show cross sections of the wall of a two-story house and fig. 4 shows a cross section of the roof and wall where they join a one and a half story house.

Beginning at the bottom, fig. 3, note that the wall plate is imbedded in the concrete and is flush with the outside. The bottom plate, to which the studding is nailed, is directly above it. This brings the sheathing and siding outside the perpendicular line formed by the outside of the basement wall and the outer edge of the studding. The mud sill, which should be at least 6x8 inches or better still 8x8 inches, is not shown in the drawings. It carries the inside ends of the ground floor joists and its ends are imbedded in the basement wall while it is supported inside the basement by one or more posts. A vital point regarding these posts is that the concrete basement floor should not be brought up around them. If it is they will rot and disastrous settling will result. They should be on a concrete base which is built up four inches above the level of the basement floor.

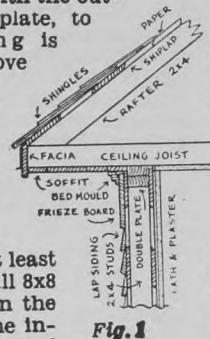


Fig. 1

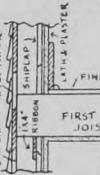


Fig. 2

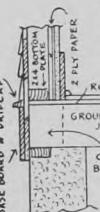


Fig. 3

For the upstairs ceiling two types of insulation are available. If bulk insulation is used all that is necessary is to lay as in fig. 1, directly on the joist or rafters, between which the insulation is placed. If blanket or sheet insulation is preferred, the construction is as in fig. 4 with strapping used to hold the insulation and to take the lath.

Fig. 5 shows how an opening for a window is framed. If the opening is for a door the trimming is the same except that the side studs come down to the floor. Where two-light windows are used

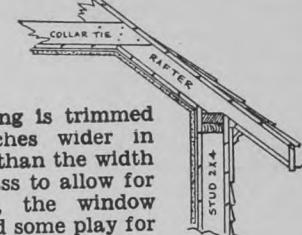


Fig. 4

the opening is trimmed seven inches wider in the clear than the width of the glass to allow for the sash, the window frame and some play for plumbing the frame. The depth of the openings are the depth of the two panes of glass plus nine inches to allow for the sash and the top and sill of the window frame. The trimmed opening is of double 2x4's all round to give wood for nailing the finish to. In cutting the studs additional allowance of 3 1/2 inches has to be made for the top and bottom trimmers. From where the bottom cut is made to the top of the finished stool is about seven inches.

When trimming an opening for an outside door leave it four inches more in height and about three inches greater in width than the dimensions of the door. In addition 3 1/2 inches must be allowed when cutting for the height, to allow for the double trimmer.

Fig. 6 shows a cross-section of a two-light window. It includes the outside and inside finish. The details of the construction of a window frame are shown in fig. 7. The inside of the frame is four inches wider than the glass.

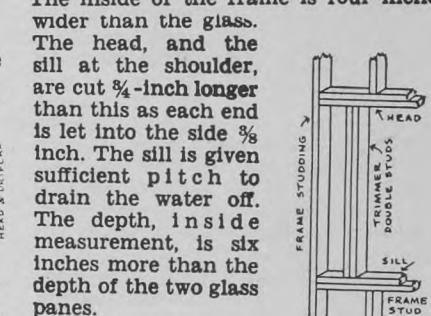


Fig. 5

The head, and the sill at the shoulder, are cut 3/4-inch longer than this as each end is let into the side 3/8 inch. The sill is given sufficient pitch to drain the water off. The depth, inside measurement, is six inches more than the depth of the two glass panes.

In fig. 7 the detail is shown. Imagine one side of the assembled frame to be sawn through after being nailed in position and that you are looking down on the cross-section, which is shown in the middle of the cut. The 2x4 is the studding in the wall, which is usually double. The frame is held in position by being nailed to the studding through the blind stop. The top sash fits between the blind stop and the parting stop and the lower sash slides between the parting stop and the window stop. Outside the blind stop the outside casing is shown. The side jamb projects in past the studding far enough to allow for the sheeting, strapping and lath and plaster. The plaster, therefore, finishes flush with the frame so that the inside casing lies flat with the plaster.

The cellar frame is the easiest of the outside frames to make. The details are shown in fig. 8. The amateur carpenter had better take his measurements direct from the sash. Be sure that the sides fit in between the head and sill so that the frame will stand up under the weight that may be put on it by the building above. It is rabbeted as shown to take the sash on the inside and the storm sash or screen on the outside.

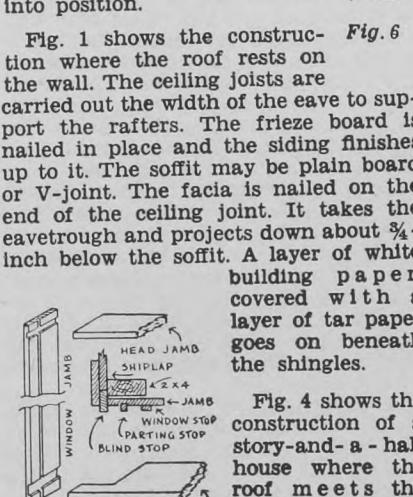


Fig. 6

Fig. 4 shows the construction of a story-and-a-half house where the roof meets the walls. The collar ties are 2x4 inches and are nailed to the rafters. The soffit is on the angle of the roof though out looks may be nailed in and the soffit put on the level. If it is, returns have to be worked in at the corners of the building.

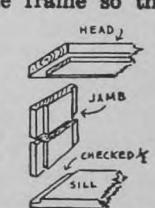


Fig. 7

How to Frame a Roof

Directions for cutting common, hip and jack rafters

BEFORE undertaking to frame a roof, make a fence for your steel square. Take a piece from a common board two inches wide and three feet long. Run a gauge line down the middle of the edges and with your rip saw run a kerf down from each end, leaving about 10 inches of solid wood in the middle of the fence. The blade of the square is inserted in one kerf and the tongue in the other. Small screws inserted in the fence will clamp it securely to the square.

Fig. 1 shows how the fence is attached to the steel square and illustrates also how the square is applied to the rafter in getting perpendicular and horizontal cuts. The tongue of the square is on the

Fig. 1. Framing a rafter with fence on square.

left and the heel cut, when the rafter is in position, is exactly up and down. On the right is the blade of the square, shown as it is applied in making the plate cut, that is the part of the rafter which rests on the level plate of the building.

When you start to frame your roof, first pick out a straight scantling to make a pattern rafter. Be sure you have it framed right and then mark all the other common rafters from it. Draw a line down the middle of the dressed side. In framing the rafter always work from this line.

Here is a handy thing to know in getting the middle of a board or scantling that has an odd width. Put your square and rule on it at an angle until you get a measurement that can be easily divided in two. The scantling will be about $3\frac{3}{4}$ inches in width. Angle your ruler on the face with the end of

the rule at one edge and the four-inch mark at the other. Then tick off a point at the two-inch mark and there you have the exact middle, haven't you?

The pitch of the roof is important. Houses are usually

framed with half-pitch roofs. In this case the rise or the height of the peak above the level of the plates is one-half the width of the building. In carpenter's language, the rise is the same as the run.

In getting the cuts the 12-inch mark is used on both the tongue and blade of the square. A common pitch used on small buildings is the one-third pitch. Both pitches are shown in fig. 2. In this case the rise is eight inches for each foot of run; the eight-inch mark is used on the tongue, still using the 12-inch mark on the blade. The tongue gives the upright cuts and the blade the horizontal ones.

Since we are dealing with house roofs we will assume that the half-pitch is used. Adjust the fence on the square so that the 12-inch marks on both blade and tongue come exactly on the centre line you have marked. First mark the heel cut, as shown also in fig. 1. If the projection of the roof is one foot, then

Fig. 3. Measuring a rafter by the step method.

the plate cut can also be marked. It is from the centre line to the bottom edge of the rafter.

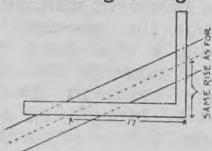
Now make the heel cut and then rip the scantling on the centre line until you come to the mark for the plate cut. Then make the plate cut. It is always best to do the ripping first, since there is less danger, when making the other cut, of sawing in past the centre line and weakening the rafter. The lower end of the rafter is now framed.

To get the length of the rafter apply the fence to the upper edge of the scantling and step it off as shown in fig. 3. First place the 12-inch mark on the blade of the square at the inter-

section of the plate cut and the rip cut. Tick off the point where the 12-inch mark on the tongue lies on the centre line. You will note that this gives you one foot of run and one foot of rise. Move the square up until the 12-inch mark on the blade is on the point you have ticked off and again mark as before. The square is applied as many times as half the width of the building in feet and the ridge cut is along the tongue of the square at the last application. If a ridge board is to be inserted between the rafters cut back five-eighths of an inch to allow for it.

You now have your pattern. The other rafters are marked from it. When a pair has been framed it is best for the amateur to put them up in place and see that all the cuts are right. Be sure you are right, then go ahead, is a good motto. It is best to put the heel cuts on the four end rafters only. Then after all the rafters are in place stretch a chalk line, mark to it and then cut off the ends. This ensures a straight edge to the roof.

Fig. 4. Getting the cuts for hip or valley rafters.



If the cornice is not on the slope, but on the level, the detail may be as shown in fig. 1, How to Frame a Frame House, on page 53. In this case the roof is framed as if the body of the house extended out as far as the end of the ceiling joist.

Cutting a Hip Rafter

To get the cuts on a hip rafter, take the same rise on the tongue of the square as for the common rafter, but instead of 12 take 17 on the blade as shown in fig. 4. Frame the bottom after the rafter is up when the proper place to make the cuts can be found by carrying out the lines from the heels of the common rafters by means of a straight edge.

To get the length of the hip rafter step it off as you did the common rafter using the same number of steps. To get

Fig. 2. Rafters for third-pitch and half-pitch roofs.

the bevel cut to fit against the common rafter take the length of the common rafter on the tongue and the length of the hip on the blade. Blade gives cut.

To get the backing of the jack rafter to fit against the hip rafter take half the width of the building on the tongue and the length of the common rafter on the blade. Blade gives cut. The novice can get these cuts by putting the rafter in place and marking by the hip. For the vertical cut at the top and the plate cut at the bottom the same bevels are used for jacks as for common rafters. To get the length of the longest jack rafter measure across from the last common rafter to the hip so that the two will be the proper distance apart and mark. Place the steel square on the common rafter and mark it directly opposite the mark you have just put on the hip. There you have the length of the longest jack.

Always nail the jack rafters on in pairs to avoid putting the hip out of line. The cuts and lengths for valley rafters and valley jacks are got in the same way as hips and hip jacks.

Precautions must be taken to have valley and hip rafters in line with the rest of the roof. Hips are placed so that the upper corners are exactly level with the other rafters. With valleys the middle of the upper edge is in line with the common rafters.

Fig. 3. Measuring a rafter by the step method.

the plate cut can also be marked. It is from the centre line to the bottom edge of the rafter.

Now make the heel cut and then rip the scantling on the centre line until you come to the mark for the plate cut. Then make the plate cut. It is always best to do the ripping first, since there is less danger, when making the other cut, of sawing in past the centre line and weakening the rafter. The lower end of the rafter is now framed.

To get the length of the rafter apply the fence to the upper edge of the scantling and step it off as shown in fig. 3. First place the 12-inch mark on the blade of the square at the inter-

How to Finish a House

Directions for fitting a window, hanging a door and building a stair

IN finishing a house the first thing to do is to fit the windows and outside doors to get the building enclosed. To fit a window, first trim the top sash so that it will fit closely against the blind stop. For details see figs. 6 and 7, in How to Frame a House. Remove sash and put in the top parting bead, cutting it long enough so that it will fit into the grooves at the side. Cut the side beads to fit the slope of the sill and fit them under the top bead. Replace the sash, dropping it to the sill, and mark the distance the bead comes out on the parting rail. Cut the sash to suit, replace it resting on the sill, slip in the side beads, raise the sash to position and fasten there with small cleats between the beads and the blind stop.

Trim lower sash the proper width, place against the beads, around which it is fitted. With a pair of dividers find the distance that the sash must be dropped to bring the tops of the parting rails flush on top. Scribe along the sill on the outside, rip off the excess wood at the bevel of the sill and fit to the sill with a smoothing plane. The sash is then held in place with the window stop.

The window stool is then cut to fit against the bottom sash and is long enough to take the side trim and allow an additional $1\frac{1}{2}$ inches to work a return at each end. The trim is then put on around the opening, last of all the apron, under the sill.

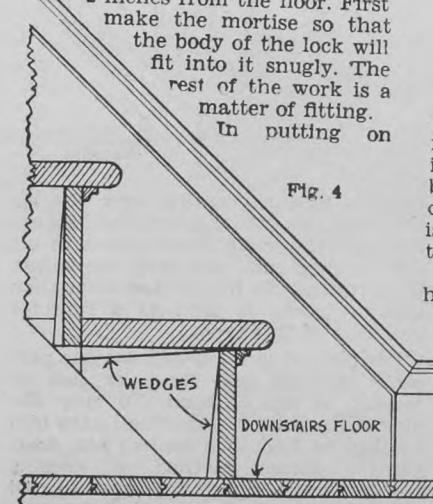
To fit a door, straighten the hinge side to fit the frame (fig. 1). Then scribe the top and other side. Inside doors swing half an inch free from the floor. Outside doors must be fitted to close just clear of the sill.

To hang a door, wedge into position tightly against the hinge jamb. With a half-inch chisel mark off the door and jamb 11 inches from the floor and six inches from the top. Use a hinge gauge to mark the distance the hinge is kept back from the side of the door and the corner of the rabbeting. You will thereby avoid hinge binding. Let the hinges into the wood the

Fig. 8

depth of the metal, with the bottom hinge above the lower chisel mark and the top hinge below the top one. Some adjustment is almost sure to be required to get the door to swing properly.

Locks are placed about 3 feet 2 inches from the floor. First make the mortise so that the body of the lock will fit into it snugly. The rest of the work is a matter of fitting. In putting on



the base, start with the longest span of wall and work in each direction toward the door. Fig. 2 illustrates how base with a moulding is coped at the corner of the room. Cut the piece to be fitted as shown in the unshaded part, at an angle of 45 degrees, using a mitre box. Cut away with a coping saw to the intersection line and if the piece shown as shaded is plumb, the other will fit against it neatly at every point. This principle applies with any pattern of moulding.

To build a stair properly calls for special skill and is best done by an experienced carpenter. The rise is the distance from the top of one step to the top of the next. The run is the distance from the face of one riser to the face of the next one to it. The step is wider than this as there is a projection. A general rule regarding the proportions of the rise and run is that the two together should total about 16 inches.

Fig. 3 shows a stair string, fig. 4 the bottom of the stair in section on an enlarged scale and fig. 5 the detail at the top, also enlarged. The shaded parts show the treads, risers, etc.

The first thing to ascertain is the exact height between the top of the finished downstairs floor and the top of the upstairs floor. It is better done with a piece of say 1x2. Supposing it is 9 feet or 108 inches; if 15 risers are used this will work out to about $7\frac{1}{4}$ inches to the riser. Set a compass

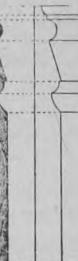


Fig. 2

to this and keep adjusting it until you come out exactly to 15. Take a piece of board about half an inch thick or less and cut it into a triangular shape, with one side equal to the rise and the other equal to the run. After straightening the top edge of the string do some experimenting and find out exactly the point where the face of the riser, extended upward, intersects the top of the tread. Since this point will be the same distance from the top of the string for each riser and tread, a line can be drawn the whole length of the string through this point. Then invert the pitchboard with the long side on the line and lay out the steps.

Now make two templates the exact size of the housings, one of the tread housing and the other of the riser housing, including the wedges in each case. The housing is at least half an

inch deep and for the nosing it is made by boring a hole that depth with a bit which is the same thickness as the tread.

Always bore the nosing holes first and then do the sawing for the housing. In building the stair, wedge the risers and treads as shown after giving the wedges a generous coat of glue. Note, fig. 4, that the bottom riser differs in width from the others because it does not have to lap over the back of a tread at the bottom.

Fig. 4

How to Frame a Barn

Procedure to be followed in trussed rafter construction

THE weight of a barn should be taken by concrete or masonry. When concrete walls are used for a low foundation it should be two or three feet above the ground level. Bolts are inserted every six or eight feet to hold the sills (fig. 1). The wall is allowed to set well before putting the weight of the superstructure on it.

For sills select straight 2x6s. Beginning at one corner place one length of the sill on top of the bolt shanks, taking care that it is exactly above the position it will finally occupy. Hit it a smart blow with the hammer over the first bolt. This will give you the mark by which to bore the first hole. Bore it and replace. The bolt will catch in the hole if one man holds the scantling down a little. Use a short straight edge to keep the edge of the sill plumb over the side of the wall while the marking is being done. Mark, bore and replace. Continue until the sills are all fitted. Then make a batch of thin cement and sand to bed the sills. If properly done the sills will be level both lengthwise and crosswise.

The posts that support the girders stand on concrete abutments going down below the stable floor and having a good large bearing surface to take the weight. In cutting them make allowance for the depth of the girder and a corbel, if one is used. Place them in proper position and brace them perfectly plumb. On top of them place the corbels, if any, and on that build the girder, after lining them true with a chalk line.

Previous to this the studs will have been framed. In the plan, fig. 6, they are 14 feet high. They are squared at both ends and the only framing that is required is a housing in each to take the ribbing piece which supports the joist. The ribbing should be 1x6 and of sound material. The top is one inch lower than the top of the girder to allow for crown.

In laying out the sills for the studs, make sure to work from the same end of the building so that the studs will be exactly opposite. Also see that the middle of the second stud from the corner is exactly two feet from the outside corner of the frame. When

the side sills have been laid out, mark the ribbing pieces from them so that the studding will be plumb.

Now you are ready to begin raising. The corner is built up of two 2x6s kept two inches apart by bits of 2x4. These are erected and braced to the inside of the sills. The next stud takes the other end of the first ribbing piece. A couple of joists can then be put up to tie these studs to the girder, with the outside ends resting on the ribbing and flush with the outside of the walls. The toenails into the girder will have to be drawn later and the heads are left out far enough to allow this to be done, not forgetting how hard it can blow in this country. Brace everything firmly, and proceed until all the side studding are in position.

The end sills and joists are then laid out to take the end studding, which are next nailed in place.

Lay out the openings for doors and windows in the stable. Fig. 2 shows how to frame a wide opening so as to prevent sagging. For nine-light stock sash with panes 9x12 the opening will be 2 feet 11 inches wide and 3 feet 10 inches high in the clear. Carry up the shiplap on the outside to the top of the joist and then straighten the walls by sighting along the top of the shiplap. With the joists all in position spike them together over the girders and toe-nail to the girders, being sure that the building

is firmly tied together to prevent spreading. Fig. 4 shows how the joists are bridged to give further strength. The top plates can then be put on and the shiplap carried up to them.

Before framing the roof lay the floor of the mow. Then clear a big stretch of this floor to lay out your rafters on. Select two studs, which are exactly opposite, and strike a chalk line between them. Get the exact middle of the building and strike another chalk line up it using the first chalk line as a base. Then on each side of this centre line, and 7 feet 6 inches from the outside of the frame strike a line parallel to the centre line. Select two straight 14-foot 2x6s and two 12-foot 2x6s as rafter patterns. For the amateur it is a cut and fit proposition. Study the framing of the roof in fig. 6 carefully. The measurements are all there. Those rafters, braces and struts, as assembled in position, can be laid out on the floor. It is just a case of using your ingenuity and every single cut and length can be figured out. The heels of the rafters are scribed to fit the sides of the studs. Where the hip comes the proper cut can be found by placing the end of one rafter over the end of the other one, ticking off where the two edges of the scantlings intersect, and drawing lines for the cuts by connecting the points ticked off. The cut at the top of the rafter is along the centre line that has been chalked off. Make a good set of patterns for one side of the roof. Be sure, and doubly sure, that everything is exactly right and if they fit together on the lines you have drawn on the floor they have got to be right when they are standing in position.

Fig. 3 shows the projection of the frame to carry the hay sling track. The top piece had better be a piece of strong 2x6, framed back into the roof of the barn. The lower piece is also 2x6 fastened to the collar tie by iron brackets and hung from the ridge in iron stirrups and stayed to the outlook rafter by iron rods to keep it in line. It is a wise precaution to tie the top of the walls to the joist by pieces of 1x6 to prevent spreading.

The window shown in fig. 5 is the one commonly used to provide additional ventilation in warm weather, and at the same time avoiding drafts. It swings out at the top in a frame, which can be either of lumber or of galvanized sheet iron so that the inflow of air is over the top.

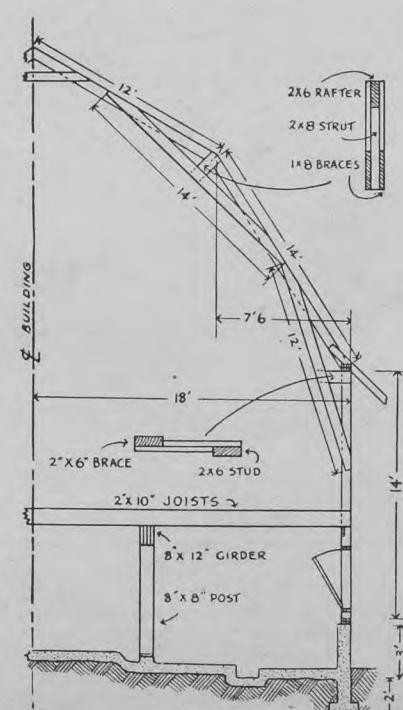


Fig. 4

Ventilation System for Stable

The single out-take flue plan

Illustrations from Dairy Barn Ventilation, by Prof. L. G. Heimpel.

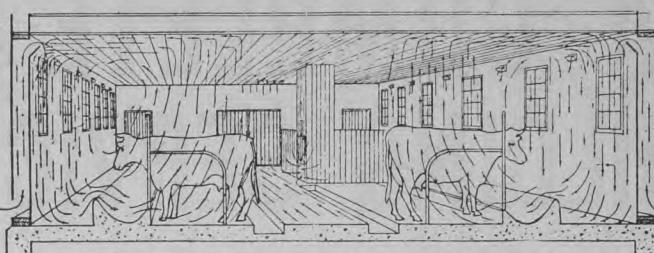


Fig. 1. The movement of air currents in a stable with a King system of ventilation having a single out-take.

Two different kinds of ventilating systems have been generally recommended. One is the Rutherford system, in which the fresh air is admitted through intakes near the floor and the foul air is taken off at the ceiling. The other is the King system, in which the intakes are near the ceiling and the out-take begins at the floor. The system here described is a modification of the King system by Prof. L. G. Heimpel, of Macdonald College, Quebec, and approved by agricultural engineers in western Canada.

The first consideration in any ventilation system is a well insulated stable. The walls should keep the cold out and be draft proof. Then sufficient fresh air can be admitted without lowering the temperature too much.

The chief feature of the modified King system is that there is only one out-take, instead of two or more. Where there is more than one it sometimes occurs that one acts as an intake. One big advantage is that one large out-take is cheaper to build and it can be located at or near the end of the barn out of the way, both in the stable and in the loft. The general movement of air in the stable is shown in fig. 1.

The most important part of the construction of this system is the out-take flue. This is shown in figs. 2, 3 and 4, which are sections of the flue standing in their proper order. The amount of air passing through the stable is governed by the out-take. The higher it is the more rapid the current and so both size and height have to be taken into consideration. For example, a stable containing 15 cows or their equivalent in weight, with



Fig. 2. The framing of the flue above the roof.

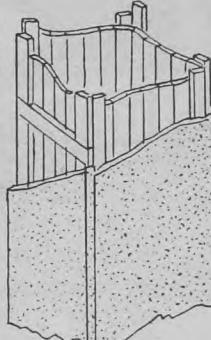


Fig. 3. The construction of the out-take flue.

a flue 30 feet long from the stable floor to the ridge of the barn would take a flue with a cross section area of 477 square inches or about 22 inches square.

The walls of the flue are insulated. This may be done in several ways. In the illustration the lining is placed upright and is of matched lumber, preferably cheap flooring. It is nailed in the inside of the frame, which is made of 1x4. The whole is covered on the outside with insulating board, in this case one inch thick. Prof. Heimpel strongly recommends this thickness. Two thicknesses of half-inch insulating board would serve the same purpose.

Fig. 2 shows the framing above the barn roof. The top is sheeted and covered with roofing. Sheet iron flashing is placed around the flue where it projects through the roof. No rainwater must be allowed to enter here as it would injure the insulation. The wind has full sweep through the frame below the top of the flue.

At the stable floor there is a slide, fig. 4, balanced by a weight on a rope and pulley. This slide is right at the floor. It is adjusted by hand, according to the air condition of the stable, which in turn depends on the outside temperature and the velocity and direction of the wind. At the ceiling there is an additional door to be opened when the stable is too hot. The out-take flue is carried straight upward without offsets, well above the ridge of the barn.

The total cross section area of the intake flues should be not less than 75 per cent of the area of the out-take. Each flue should be not more than 50 square inches in cross section area. As most stable studding in this country is six inches the flue should be not more than seven or eight inches wide. No intake should be closer than eight feet to an out-take.

Three designs of intakes are shown in fig. 5. The middle one shows the design used when the installation is made at the time of building. The others may be used for installations in old buildings or with concrete. Note that a flange, on the left hand and the middle designs, keeps the wind from blowing directly into the flue. In each case notice also that the air at the top is deflected toward the ceiling and that a cover is provided to cap the flue so that some of them may be closed when there is a very strong wind blowing, especially in very cold weather.

Prof. J. Macgregor Smith, of the University of Alberta, describes the ventilation of a large pig pen by this system. He made the flues only half the thickness of the walls and placed them against the outside sheeting, leaving a space for additional insulation between the flue and the inside lining.

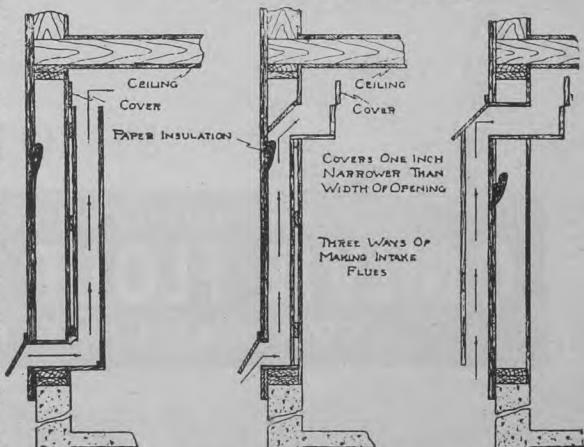


Fig. 5. Different ways of building intake flues.

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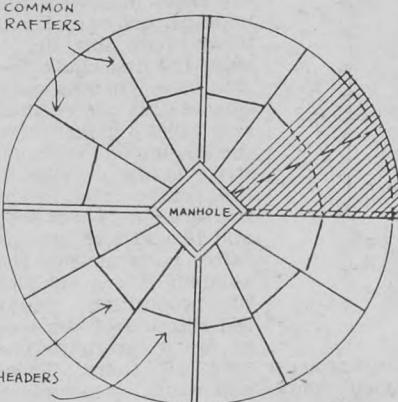
STORING Grain on the Farm is a timely bulletin by the Manitoba department of agriculture. It gives directions for building several types of storage bins, permanent and temporary. One of them is called the Brock Round Bin.

This is a circular bin constructed similar to a silo but using wood instead of metal hoops. This method of construction, however, presents some difficulties and hence a rather extended description of the method of construction follows:

The base is supported on three main

COMMON
RAFTERS

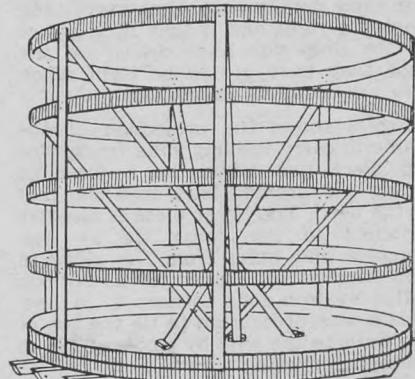
HEADERS



How the roof is framed and boarded.

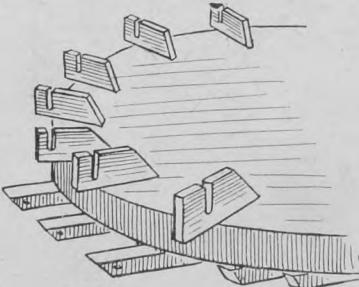
skids each 16-ft. long (the centre one 4-in. x 6-in.; the other two 6-in. x 6-in.); and on four auxiliary skids (two 12-ft. long and two 7-ft. long—all 4-in. x 6-in.). The skids and the joists are all on 21-in. centres. All skids are bevelled at ends to form runners and these sawed off portions are used as stiffening braces behind the joists.

After firmly toe-nailing the joists to the skids, the next step is to pencil a



Hoops braced in position ready for siding.

circle on the ends of the joists by using a light wire 7-ft. long nailed at the exact centre of the middle skid. Proceed to cut off the ends of the joists on this circle. Pieces of 1-in. x 4-in. spruce are then bent around the ends of the joists and firmly nailed. This gives a perimeter of approximately 44-ft. Proceed now with the flooring at right angles to the joists and nail firmly to joists and outer rim. Trimming of the floor ends can be done



Temporary templates are placed on the base for bending the wooden hoops.

free-hand as each board is laid, by using the rim as a guide.

The bands are made of three-ply spruce resaw 4-in. wide. With a perimeter of 44-ft. it follows that six 14-in. lengths and three 16-ft. lengths are necessary for each 3-ply band. Blocks or forms for constructing the bands can be made from pieces of 2-in. x 8-in. (as illustrated in the bottom cut) and toenailed to the base so that "cut-outs" coincide with the rim of the base. Care

should be taken to stagger the resaw so as to break the joints by at least 4-ft. which gives greater strength to the bands. The three-ply are then nailed together (using 1½-in. coated nails) sufficiently to allow being lifted out and handled without springing apart or losing shape. As these bands are spaced 2-ft. on centres, it requires five for an 8-ft. wall and six for a 10-ft. wall. If greater strength is desired, 4-ply bands could be used at very little extra cost.

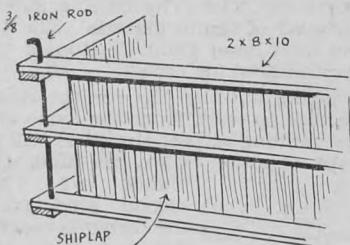
The walls are started by having the first band resting on top of the base with each succeeding band 2-ft. on centres and temporarily braced as illustrated in the middle cut. It is advisable to start nailing the siding close to one side of where the door openings are intended to be, and progress around the bin. It is essential to plumb the first board. Any type of material may be used for siding, provided it is weather tight. Fir flooring is the best. Material wider than 6 in. is not recommended. It is advisable to wrap the exposed bands at door openings, using strips of tin about 1½ in. wide to protect them from damage while shovelling.

The roof of this bin is constructed similarly to the circular silo roof with rafters. It has a two-foot square opening at the peak for filling. The pitch should be one-quarter or less. It is covered with 3-in. flooring as shown in the top cut, so that when completed it gives the effect of four pieces of pie with four seams along the four main rafters. These and where the roof boards meet the manhole should be packed with tar plastic. Two applications of any good quality tar paint mixed with fine sand will make satisfactory waterproofing. The lumber should be dry and the weather warm to make a satisfactory job. After the second application of tar paint, scatter coarse sand on the roof.

The doors are made similarly to those of a stave silo. They should be in sections to fit from band to band.

Portable Bins

I built two bins and put one at each end of the field. These I filled during the night when there were no teams or trucks to haul home the wheat. I used



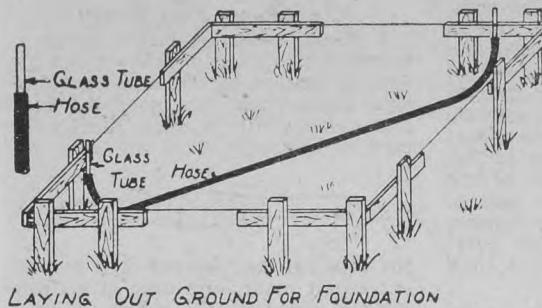
a tractor and combine with lights and pulled out of the swath at each end and emptied the hopper into the bin. They are so light that they can be moved by one man with a trailer or light wagon. They can be taken apart and moved in sections, but the sections should be numbered so that they will go back in the same places when being set up again. If the corners leak hang sacking inside.—R. W. Rowles, Empress, Alta.

Concrete Granary Floors

Concrete granary floors are entirely satisfactory when properly made and are largely used in commercial grain storage. The important things are to have the floor at least 10 to 12 inches above the general ground level, to have broken stone or coarse gravel filled in under it, to have roll roofing or heavy waterproof felt with lapped and cemented joints on top of the fill, to use woven wire fencing or other reinforcing to prevent cracking, to give the floor at least one-fourth inch slope to the front towards the sides, to use a rich mixture and trowel smooth, and to give plenty of time for the concrete to cure and dry before grain is put on it.—I.W.D.

Dusty Cement Floors

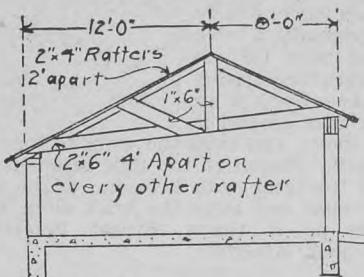
When cement floors wear and become dusty, the trouble often can be remedied by mixing one part of water glass to four parts water, pouring it on the floor and spreading it with a broom. Let it dry naturally, and apply a second coat if the dust still shows.—I.W.D.



LAYING OUT GROUND FOR FOUNDATION

Simple Roof Truss

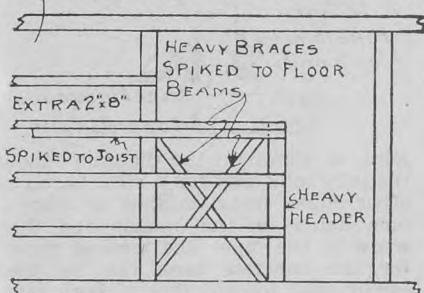
Rafters or joists over 12 or 14 feet long are likely to give trouble from sagging. This is a simple and inexpensive truss which may be used for poultry houses, machine sheds and other buildings.



ings up to a width of 20 or 24 feet without sagging. The diagram shows one for a width of 20 feet, using 2x4 rafters and 2x6 stringers with 1x6 braces. The rafters are two feet apart and every other one is trussed as shown.

Unsupported Corner Construction

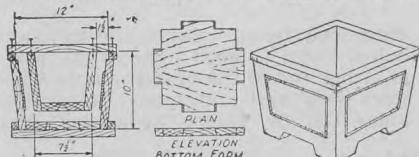
The diagram shows a good way to build corners at stairways and projections where it is not convenient to put in a supporting post. A heavy diagonal brace is spiked to the floor beams, and



this supports another diagonal brace, which in turn supports the corner. One or more of the floor joists are also doubled for extra support.

Concrete Flower Pot

For use in front of the house a concrete flower pot is simple to make, inexpensive and in good taste. This plan is a standard one. The forms are made



of inch stuff. The centre figure is a false bottom placed in the form to make the legs on which the pot stands. The surfaces of the forms next to the concrete should be sandpapered as the least grain will show on the finished article. Also apply two coats of shellac to prevent warping. When assembling be sure to have both inside and outside forms exactly centred to give uniform thickness throughout. Oil the form faces well before pouring the concrete. Fine aggregate is used.

Barn Stall Partition

An improvement over the old way of grooving 6x6 stall posts to hold the ends of partition planks is to place a length of angle iron on each side of the partition, putting $\frac{3}{8}$ -inch wood screws into the posts and $\frac{3}{8}$ -inch bolts through the angle irons and planks. This makes a far stronger partition.

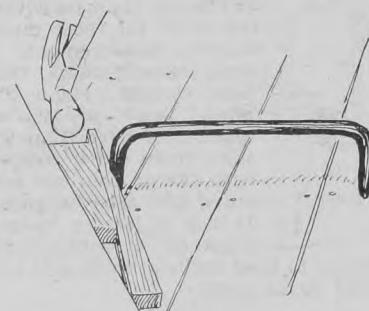
Roy French, Donavon, Sask.

Levelling Foundation

The diagram shows clearly how to use a garden hose to level up a building foundation. Use a 50-foot section of garden hose and insert a steam engine water glass in each end, fastening them in place firmly by means of friction tape. Now fill the hose with water, hold one glass against the batter board at one corner and the other glass at the opposite corner or at any other desired point. The water lines in the two glasses will give an exact level.

Taming Refractory Flooring

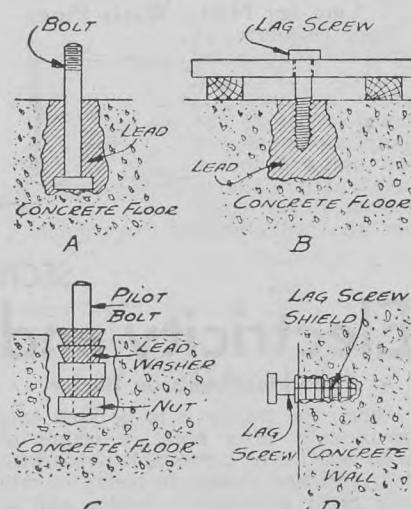
This enclosure outlines an idea that may possibly be useful to someone who, like myself, occasionally comes up against the problem of trying to persuade serpentine pieces of flooring to come within bounds by the aid of nothing more potent than a wood-chisel and some compound cuss-words.



Being the sort of bird that likes to monkey around in a workshop himself, I never cease to marvel at some of the "inventions" produced from odds and ends picked up in the farm "boneyard," and which find their way to the farm workshop.—The boys are good!—R. S. MacNeill, Shelby, B.C.

Anchor Bolts in Concrete

Here are four handy methods of anchoring machines or timbers to concrete floors or walls. The first method (a) shows the usual method of fastening sills to concrete floors with ordinary machine bolts with the heads imbedded either in the fresh concrete or in holes



filled with lead or babbitt. Be sure there is no water or oil in the holes to make the hot material spatter. Machines are often fastened to concrete floors by drilling an irregular hole (b), setting in a lag screw, and then pouring lead or babbitt in around it. The lag screw can then be unscrewed and tightened as desired. Timbers and machines may also be fastened to concrete walls and floors (c) by using lag screw expansion anchors put into a hole in the concrete and expanded as the lag screws are turned into them, or (d) by putting an ordinary nut on the end of a pilot bolt, slipping lead washers over the bolt and spreading them with a loose nut and a short piece of pipe until firmly wedged. Then the pilot bolt is turned out and a machine bolt of the desired length screwed in.

How to Use Concrete

It is still the best material to use in making many things about the farm

IN marking out the land for a building the simple use of stakes is often recommended. This method, fig. 1, is an improvement. Small strips of

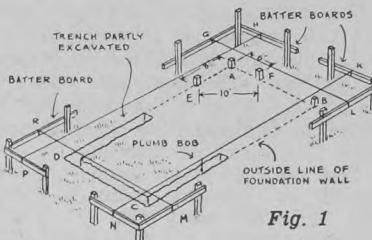


Fig. 1

wood are fastened to the stakes as shown. It is a lot easier to move the string along the strip than to move a stake. In getting the building square there is the good old 6, 8 and 10 rule. Measure 6 feet along one side from the corner, and 8 feet along the other. The diagonal is 10 feet, and if it measures that much exactly the corner will be exactly square.

It may be a long time before they get anything better than concrete for building walks. A thickness of four inches is enough and the width should be 18 inches or more. It is well to have it finished a couple of inches higher than the ground. For drainage a slope to one side of one-quarter to one-half is satisfactory and will scarcely be noticed. Rains will then tend to wash it clean.

One course construction, with the finer material worked on top, is the most satisfactory and lasting. Build in 4-foot sections, using 2x4's as sides, and inside the cross piece

place a strip of tar paper. Leave this between the concrete at the intersections. When built in sections the walk is less likely to crack. Finish with a wooden float and after it has set sufficiently to prevent marring, cover with sand or earth for a few days until fully hardened.

Concrete steps neither rot nor burn, and if they are finished with a wooden float the surface will be gritty and therefore non-slip. This set is designed for the back of the house and is very plain. For front steps sides can be worked on. The forms, fig. 3, are of plank and concrete is saved by building a core of stone or earth. Steps should be not more than $7\frac{1}{2}$ inches high with a tread of about 10 inches. When a walk leads to the steps it should be built first and the steps afterward.

In fig. 4 is shown the cross-section of a concrete floor for the cow stable. The suggested measurements are given and they will be about right. Notice the different ways of building the manger. The gutter is put in at an angle, with the standing platform ranging from 4 feet 6 inches to 5 feet 2 inches in length to accommodate different sizes of animals. When putting in a concrete stable floor it is best to get a booklet from the dealer which gives full instructions for all the operations.

If there is one thing that requires more care than it receives on the average farm it is the well covering. This is on two counts: First, to make it safe for children, and second to prevent surface drainage into the well. Nothing equals concrete for this purpose. Fig. 5 shows the construction in cross section

with a manhole and a hole for a pump. The cribbing used in construction is shown. Note that on the outside the concrete is carried down a few inches below the surface of the earth. This provides greater insurance against surface drainage. A neat trick in placing the concrete over the well is to cut the cribbing to fit the top of the well and support it by wires to a framework above. The cribbing can be removed after the concrete has hardened. Old angle iron should be embedded in the concrete to strengthen it over the well. The edges of the manhole and pump hole are raised slightly to prevent the water from entering.

Fig. 5

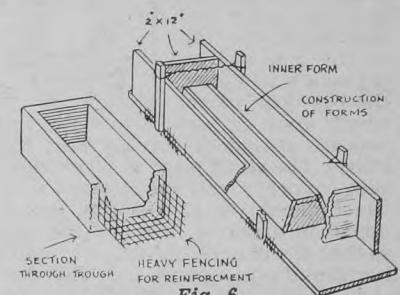


Fig. 6

A well-made concrete hog trough, fig. 6, is cheap, easily kept clean, heavy enough to prevent upsetting easily, and should last a lifetime, barring accidents. Use a stiff mixture of one part cement, two parts sand, and three parts coarse gravel, and use the form and reinforcing as shown. If preferred, a hole of the proper shape can be dug in the ground with the core part enough lower to give the proper thickness.

Fig. 7 shows the construction of an underground concrete tank for any purpose, such as a cistern or a septic tank. It is now recommended in this western country, for example, that instead of the tile system of disposing sewage an underground tank be used and pumped out when it is full. In building an under-ground structure such as this, forms are used up to where the roof starts to curve. Then a platform is built and on it moist sand is shaped to the inside dimensions of the curved top. The concrete is then applied, and after it has set the sand and inside cribbing can be removed. Cement blocks can be used in a cesspool if there is no danger of contaminating the well, but it is better to be cautious and build it of concrete plastered on the inside with a waterproof coat of equal parts of fine sand and cement.

It is a simple matter to waterproof basement walls and floors. Simply have the walls dry and warm and apply two or more coats of hot asphalt or coal tar or paraffin, roofing cement, asphalt paints, or various patent waterproof coatings. For the floors, lay on top of the earth a ply of roll roofing or heavy waterproofed felt with the joints lapped and cemented, give a coat of hot asphalt, and then lay the concrete floor in the

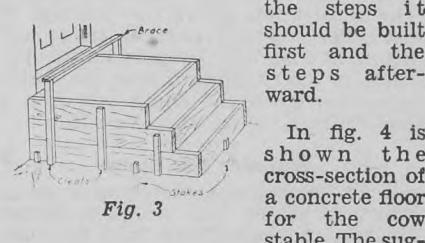


Fig. 4

regular way, and there should be no trouble from moisture working up through.

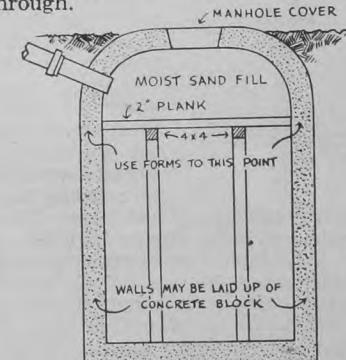


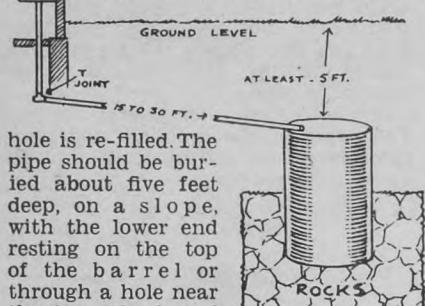
Fig. 7

SECTION 15

Water, Drainage and Heating Systems

Cheap Sewage System

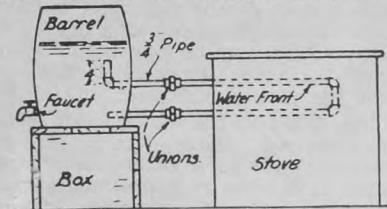
This system is composed of a pipe leading from the kitchen sink, under ground to a buried oil barrel or box which, in turn, stands on several feet of rocks. Rocks are also piled around the barrel for part of its height. The barrel is covered with earth and some sacking or paper placed on the rocks before the



hole is re-filled. The pipe should be buried about five feet deep, on a slope, with the lower end resting on the top of the barrel or through a hole near the top. The barrel should have no bottom and the stones beneath should be covered with coarse gravel. The short piece of pipe from the sink connects with the horizontal pipe, which should be 12 feet long and four inches in diameter. Use a T-connection so that the plug can be removed and the horizontal pipe cleaned out. This system should be used to dispose of liquid waste only. The scraps are better fed to the hogs.

Hot Water Heater

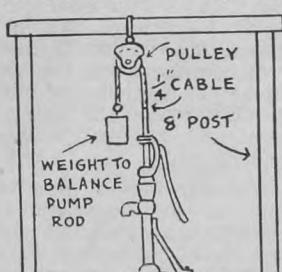
This heater can be made cheaply and will keep lots of hot water available. It is attached to the kitchen stove. Most



stoves are made with holes for putting in a water front. Use $\frac{3}{4}$ -inch piping and a barrel with a faucet. The unions can be secured at any hardware store.

Easier Pump Operation

In a deep well, the plunger and long pump rod may weigh a good many pounds. To avoid lifting this dead



weight every stroke and letting it drop back with a jerk, many owners balance it with a rope run up over a pulley, as shown in the above diagram. This permits the use of a smaller motor and saves much wear and tear on the pump. A similar result can be secured by using heavy coil springs which are compressed on the down stroke and help to lift the plunger on the up stroke. The pulley should have ball bearings, and the weight should just about balance that of the plunger and rod.—I.W.D.

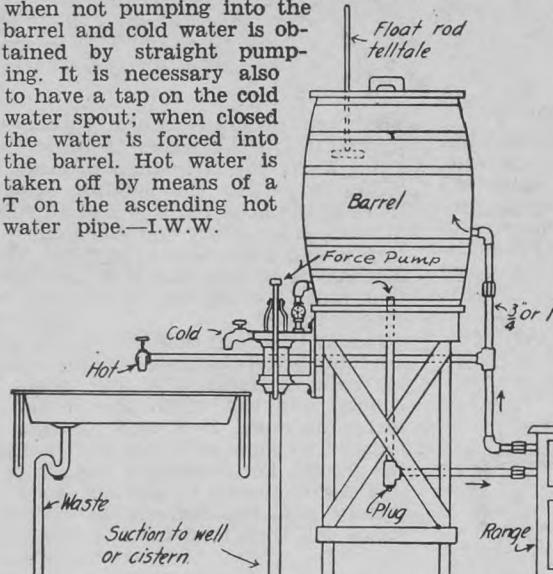
Protection from Frost

Now that zero weather is here how many farmers try methods to protect their shallow dug wells from ice. I did it this way. I put a second cover or ceiling three feet from the top by nailing 2x4's all around on the cribbing and covering with boards and paper. Then I packed in with straw. If a pump is used a hole only large enough for the cylinder needs to be left. If you bail the water out with a bucket a second lid will have to be put on, and this could be covered with sacking. In spring the straw can be removed and a fine

cool place is left for storing eggs, butter, etc.—H. C. Pinnegar, Box 103, Langdon,

Cheap Water Installation

The accompanying drawing shows how this installation is made. When a barrel like this is utilized no pressure can be used. The float tells how high the water is. A tap in the connection between the pump and the barrel is closed when not pumping into the barrel and cold water is obtained by straight pumping. It is necessary also to have a tap on the cold water spout; when closed the water is forced into the barrel. Hot water is taken off by means of a T on the ascending hot water pipe.—I.W.W.



An Improved Windlass Well

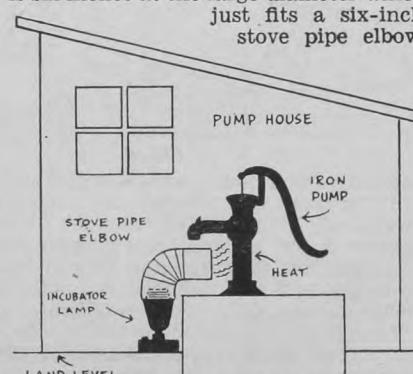
This simple, pumpless well performs with surprising ease and efficiency. An 8-in. tile leads down to water which is only 14 ft. below ground. The top of the tile bell end is provided with a milk can cover with which it is closed when the well is not in use.

A rope winds about a hand turned windlass, runs up over a pulley in the top of the well house, then extends downward and is tied to the 6-in. sheet iron cylinder which is the bucket. This bucket has a flap valve in the bottom and a strap iron hoop on the top. Dropped into the water it quickly fills but the valve seals the bottom when the bucket is drawn up.

To empty it is but a single movement. The illustration shows the position of the bucket. At the far end of this trough is turned a lag bolt. Dropped on this the valve is forced upward and the water runs out, down the chute and into a pail waiting for it.—Dale Van Horn.

Warming the Pump

I am enclosing a sketch of a pump which is heated with a double burner Buckeye incubator lamp, with two one-inch wicks. The chimney on the lamp is six inches at the large diameter which just fits a six-inch stove pipe elbow.



This, inside a small pump house which is insulated, will keep the pump from freezing at all times. I use just the regular iron pump with the cylinder at the top. This should help any who have trouble with their pump freezing up.

Underground Water Pipes

Various methods have been tried for insulating underground water pipes,

such as putting them in tiles, covering them with moulded insulation, and so on. All of these are rather expensive and to be effective must keep water out of the insulation which is rather difficult to do. About the only practical solution is to put the pipes about six feet underground and then spread fodder or flax straw or manure along on top of the ground to act as an insulator and to hold the snow. If any of our readers has a practical solution to this question, we should be glad to have their experiences.—I.W.D.

Insulating Furnace Pipes

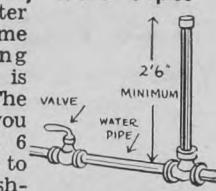
One reason why your fuel bill is too big may be that you are burning too much fuel to heat your cellar, and not enough to keep the rooms warm where the family lives. A thorough study of heat wastes in the cellar brought out some rather surprising things. For example, it was found that a great deal of "insulation" that is put on warm-air furnace pipes is actually worse than no covering at all for these pipes. Careful measurements of heat losses shows that bare, bright, clean tin pipes lost a smaller amount of heat than the same pipes did if covered with one or even two layers of thin asbestos paper. It took at least a $\frac{1}{4}$ -inch thickness of asbestos insulation to keep the heat in as well as a bright metal surface.

Repairing a Noisy Tap

A water line, tap or pipe that chatters when the water is running slowly has a loose washer (W). If the tap drips the rubber is worn out. To repair the tap, shut off the water line, unscrew the cap (A), unscrew the shaft (B-B) by screwing out the handle and shaft. Remove the screw (C) and take out the rubber washer (W). Rubber washers can be obtained for a few cents each. They come in three sizes, so obtain the correct size. Hard rubber and soft rubber washers are readily obtainable for hot water or cold water taps.—W.K.

Cure for Noisy Water Pipes

Does the cold water pipe in your home thump and bang when a faucet is closed suddenly? The figure shows how you can use a 2 foot 6 inch length of pipe to provide an "air cushion" that will eliminate this trouble.



SECTION 16

Electricity and Electric Wiring

Auto Headlights on Tractor

When the tractor is to be used only occasionally after night, a couple of good gasoline or kerosene lanterns with reflectors and clamps to fasten on will give fairly satisfactory results, and at other times will be very useful around the farm.

Many tractor operators are getting very satisfactory results from home-made lighting systems formed from generator, battery, and headlamps and bulbs taken from old autos. Get a battery station or garage man to check up the generator and see that the commutator and brushes are in good shape and then have him test the output and cut-out action. A little time spent on this may save a break down at a critical time. Then arrange to drive the generator at about 1,200 r.p.m. from some rotating part, the most convenient place depending on the make and model of tractor.

In some cases the drive pulley may be clamped to the fan belt just back of the fan, or perhaps clamped to the fan hub. In other cases to the belt pulley, to the

Temporary Pipe Repair

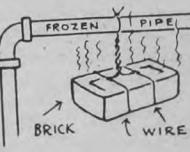
A handy way to make temporary repairs for cracked or leaky pipes is to wrap a strip of tightly stretched inner tube around the pipe over the break and fasten with friction tape, heavy cord, or soft wire. This will hold until



the pipe can be replaced or a permanent repair made, and may save throwing the water system out of use at an inconvenient time.

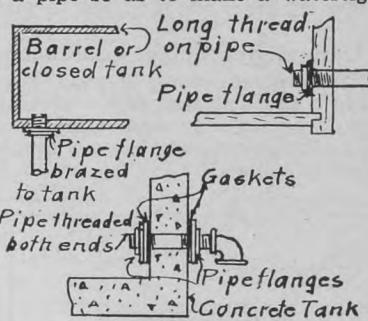
Thawing Frozen Pipes

For thawing out frozen water pipes in cisterns, tanks, etc., where an open flame will do no damage, a brick and wire torch serves the purpose. Take a brick, wrap the wire around it as shown and twist the wires to form a handle. Fasten to the pipe after soaking the brick with kerosene. Light the kerosene and move the brick along the pipe as it thaws.—Ernest Peterson, Chinook, Alberta.



Pipe Connections to Tanks

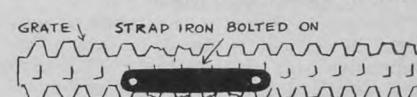
In fixing up water tanks, cistern connections, and other work about the farm, it is often necessary to connect up a pipe so as to make a watertight



joint, as shown in the diagram. About the only solid way for a steel barrel or other closed metal tank is to braze a pipe flange on the outside and then screw in the pipe. The method shown for the concrete tank can be used equally well for any type of open tank.

Mending Broken Grates

The grates in our kitchen range became so worn in the middle that the fuel was wasting. We took two pieces of



strap iron, bored holes at the ends and bolted them to good links of the grate at either end of the broken places. They work very well and appear to be durable.—Carl A. Tatroe, Sedgewick, Alta.

SECTION 16

Electricity and Electric Wiring

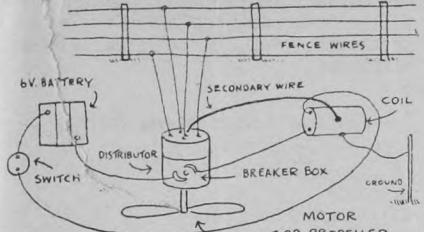
magneto shaft, to the governor shaft, etc. The proper diameter of drive pulley can be found by multiplying 1,200 by the diameter in inches of the generator pulley, not at the bottom of the groove, but at the centre of belt contact, and dividing this by the revolutions per minute of the part on which the drive pulley will be placed. Careful regulation of speed is not essential, since it may vary from 800 to 1,500 if the output is properly controlled by the third brush regulation; but it will be necessary to have the drive pulley carefully centred, and lined up to prevent vibration of belt and generator.—I.W.D.

Electrifying Farm Fence

"I wish to electrify a fence surrounding my feed yard. A six-volt battery will supply the current. What type of coil should I use and how should the whole outfit be wired?"—R.L.B., Swanson, Sask.

To electrify a fence using a six-volt storage battery you require a six-volt ignition coil such as is used in most modern cars. In addition an interrupter is desirable as this will conserve the

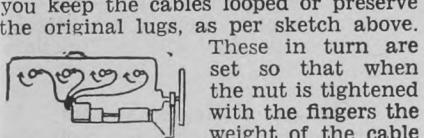
battery and under the worst conditions of shock will produce less serious results. The complete distributor of a wrecked car mounted in a hood with a small wind propeller is a simple interrupter. A motor driven interrupter made from a six-volt fan motor could also be used



and driven from the battery. This latter plan, though harder on the battery would be the most satisfactory as it would work in calm weather. The wiring of this outfit is identical with the wiring of the car from which the parts were taken except that the wires which lead to the spark plugs are now connected to the various fence wires and the ground of the coil system is connected to a rod driven into the ground. The diagram would be typical for most car wiring systems.—Prof. G. L. Shanks.

Keeping Spark Plug Wires Tight

Having seen a hint in your workshop department for keeping spark plug wires tight I am sending you a sketch of what I think is a better idea still. I find that the use of lock washers will not suffice on a tractor with the plug holes machined horizontally but will continually fall off unless you keep the cables looped or preserve the original lugs, as per sketch above.



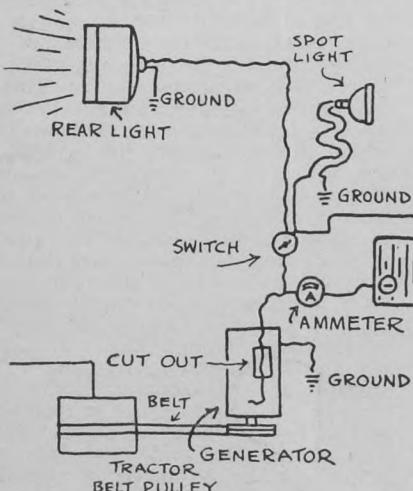
These in turn are set so that when the nut is tightened with the fingers the weight of the cable will pull the nuts as shown in the diagram and tend to make the cable vibration tighten the nuts as long as the vibration of the operating motor lasts.—Jas. D. Urquhart, Jr.

Tractor Lighting System

Many farmers have old lighting systems from an old automobile which they wish to use on a tractor. The old generator cannot be used without a battery, which materially increases the cost. Also old auto headlights are not very well suited to withstand the vibration of a tractor. They tend to break bulbs and connecting wires. However, for those who want to use such a system, the usual method of driving the generator is from the tractor fan belt, either by a pulley on the outside of the belt or by using a longer belt. Some sort of bracket has to be improvised and means provided for tightening the generator into the belt. The correct speed for the generator is from 900 to 1,200 r.p.m.—G. L. Shanks.

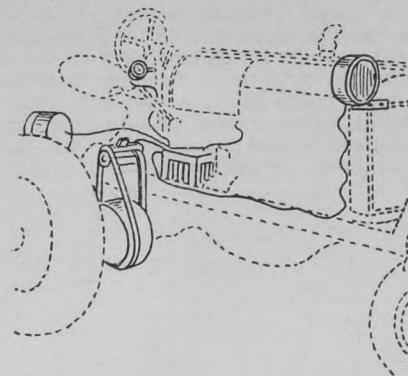
Lighting System for Tractor

All parts with perhaps the exception of the V-belt can be taken off an old car. The principal trick is to take the



generator and attach it to the tractor in such a way that it can be driven by the tractor belt pulley. Most tractors have a 10-inch belt pulley which runs at about 900 r.p.m. The proper speed for a generator is about 2,200. Therefore, one must see to it that the correct size of pulley is used on the generator to develop the proper speed. In this partic-

ular case the generator pulley should be about four inches. Your tractor dealer can give the rated belt pulley r.p.m. for your tractor if you do not have a speed indicator.

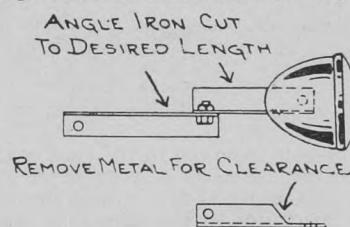


Even the old dead battery can be used, and it is not necessary to buy a new one. However, if the battery is dead there will be no lights while the motor is not running. But a battery of some sort must be used to take up the excess current when necessary. Otherwise, it might damage the generator.

It is not a difficult trick to do the wiring if you follow the wiring diagram. The wire should be well insulated against shorting and also against dampness during wet weather. Old rubber garden hose and the use of friction tape should solve the problem.—Kansas Circular.

Mounting Rear Tractor Light

Here is a handy mount for the rear light on the tractor. It is made of two pieces of light $\frac{1}{2}$ -inch by $\frac{1}{2}$ -inch angle iron each about three or four inches long. The two irons are held together

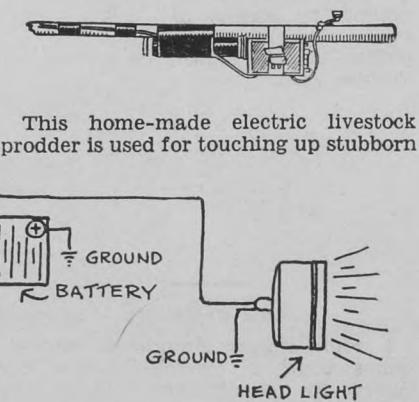


by a bolt as shown, and are fastened to the fender or tractor frame by a second bolt. The light may be adjusted for height by loosening the first bolt, and from left to right by loosening the second bolt.—I.W.D.

Switch for Van

Here is a very easy switch to make for a van with a double contact bulb. I used the T top of a Ford coil. It snaps on two round headed screws. The coil top swivels on a little wooden plug from a twine ball. It is notched so that when you turn the switch on it does not slip.—Howard T. Shorrock, Minnedosa, Man.

Electric Persuader

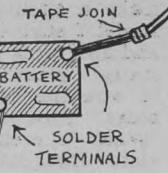


This home-made electric livestock prodder is used for touching up stubborn

cows, hogs, or other animals when they object to going up loading shutes or into trucks or cars. It consists of a Model T Ford coil clamped to an old billiard cue and actuated by a three-cell flash-light battery and a simple push button switch. Insulated wires leading from the coil out to the end, deliver a hot spark where it will do the most good. This is much more humane than a club or a pitchfork and does not bruise the flesh or damage the hide.—I.W.D.

Avoiding Bad Connections

You can avoid bad connections at battery terminals by soldering the terminal clamps to the posts and joining the leads a foot or so away. The joins in the leads will have to be wrapped with tape to protect them and prevent short-circuiting.—Grant Macleod.



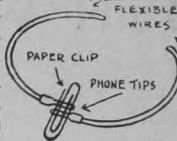
Soot Slows Down Heating Plant

Soot deposits on the inner surface of a furnace are costly in fuel. Soot is almost as good a heat stopper as asbestos or rockwool. The heat that doesn't get through the furnace wall goes up the chimney and is com-

pletely wasted. To clean off soot by spreading a highly combustible substance on the fire is not very thorough and rather risky. It's much slower and a dirtier job to scrub off the soot with a heavy wire brush; but it's the best way.

Jiffy Connector

I found that a paper clip serves excellently when temporary test connections are to be made. While the diagram shows two phone tips held together with a paper clip, almost any connection could be made in a similar manner. Flexible wires, as well as solid ones can be joined together without the trouble of twisting them.—Wm. J. Dutka, Emerson,



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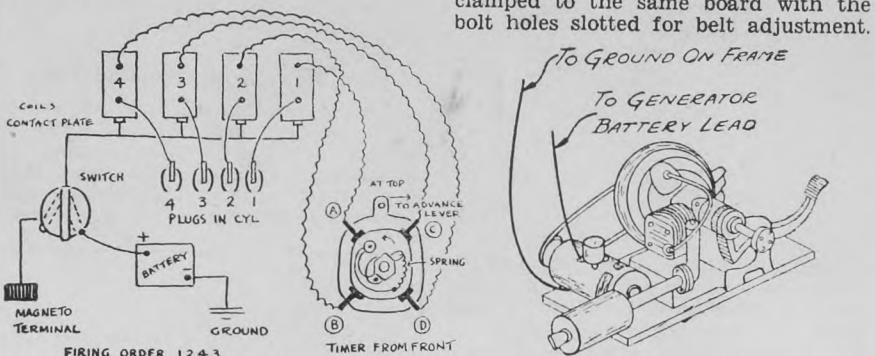
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Wiring Model T. Engine

A subscriber states that he wishes to make a circular saw engine out of a Model T engine, using all four cylinders and also using clamp to the battery. He states: "What I wish to find out is how to wire the coil timer and the spark plugs." Prof. G. L. Shanks answers: "What your enquirer wants is a complete wiring diagram for an old Model T Ford. The attached diagram indicates



all the necessary connections and names the parts."

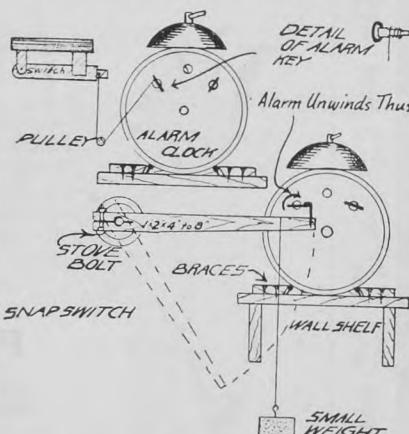
Another subscriber writes: "By using the Model T spark coils is it possible to build up the voltage of the 6-watt battery or generator? I have a 6-volt outfit but find in many cases it hasn't the power needed. Could you tell me how high I could jack the voltage, if any, and also the watt power?"

To this question Prof. Shanks replies: "Your subscriber is apparently on the track of a perpetual motion idea. It is true that a Ford spark coil will step up voltage from 6 volts to approximately 5,000 volts, but it is done at the expense of the amperage. In the end the volts times the amperes or watts, is less than in the beginning and there is a loss in watts rather than a gain."

Alarm Clock Time Switch

An alarm clock can be used as a time switch for any electric circuit on the farm or in the shop. It will turn off the poultry house lights, the battery charger, the milk cooler, turn on a small stove and other similar jobs.

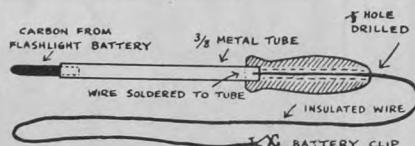
Where electricity is not used, the clock and wooden control arm can be



set up to control the furnace dampers. For this arrangement connect the front damper of the furnace to the rear damper on the stove pipe by a light chain over a set of rollers. Adjust the chain so the front damper is three-quarters open when the rear damper is just closed. Balance the system with a small weight so the front damper stays open. In the evening connect a strand to the alarm clock control to hold the weight on the chain up (front damper of furnace closed, rear open). The alarm clock (remove the bell) will drop the weight and reverse the dampers at six a.m. in the morning.—W. Kalbfleisch.

Six-Volt Soldering Iron

I have a diagram here showing how to make a six-volt soldering iron. The

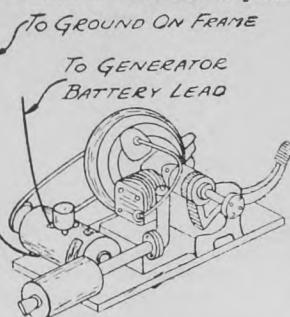


wire from the battery clips on one post of the battery and a wire from the work to be soldered to the other post thus

making a circuit. I have found this iron to work very successfully.—John Nickolson, Cairns, Alta.

Handy Battery Charger

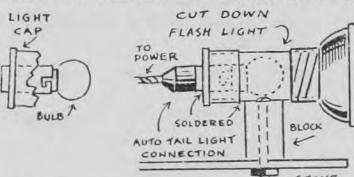
A handy portable arrangement for quickly recharging auto or radio batteries or for furnishing light at camp consists of a small washing machine engine mounted on a two-inch plank with a V-belt driving an auto generator clamped to the same board with the bolt holes slotted for belt adjustment.



The heavy wires from the generator are fitted with heavy battery clamps, one being fastened to the car generator terminal or to the ammeter terminal and the other grounded on the engine or frame. Such an outfit will deliver from 10 to 15 amperes and will recharge a battery in a few hours.—I.W.D.

Rear Light for Tractor

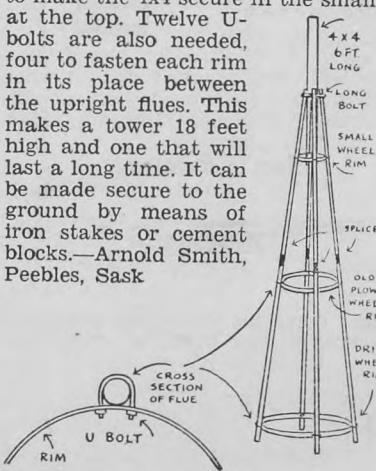
A rear light for the farm tractor can easily be made by cutting a flashlight down as shown. A hole is made through the flashlight cap where an auto tail light connection and bulb is soldered on.



The light is mounted to the rear of the tractor by means of a wood block and stove bolt, which is first pushed through from the inside of the light case. Such a light gives considerable illumination at a minimum cost and with very little power.—A. S. Wurz, Jr., Rockyford, Alta.

Tower for Wind Charger

To make a tower for a battery charger, take boiler flues from an old steam engine and get them acetylene welded, making four pipes each about 16 feet long. A piece of 4x4 about 6 feet long and three old wheel rims are needed, one from a drill wheel, one from a plow wheel and a third about 12 inches in diameter. Four long bolts are needed, two about 10 inches long for the top of the flues and two about 14 inches long to make the 4x4 secure in the small rim at the top. Twelve U-bolts are also needed, four to fasten each rim in its place between the upright flues. This makes a tower 18 feet high and one that will last a long time. It can be made secure to the ground by means of iron stakes or cement blocks.—Arnold Smith, Peebles, Sask.



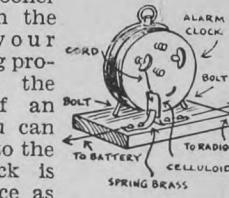
Care of Battery

I would suggest owners of two-volt radios using a six-volt storage car battery for operation by cabling to a single cell at a time; to change over to a new cell at least every three days and repeat this process until the three cells are all discharged at the same rate and about at the same time. Using a single cell until it is completely discharged is a bad practice, as after the third or last cell is discharged the first cell reaches a deplorable condition; excessive hard sulphate forms on the plates which offers a high internal resistance. Unless a low charging rate is

used, the cell will heat, possibly causing the plates to buckle and throw out the paste from the grids. Thus each cell would have to be charged separately, or the charging current maintained low or the battery may be ruined; but by having all the cells at a more or less equal discharge; recharging then will be faster and the life of the battery prolonged.—Tony T. Drewniak, Tolstoi, Manitoba.

Alarm Clock Starts Radio

If you would sooner be awakened in the morning by your favorite morning program than by the raucous call of an alarm clock you can hitch the clock to the radio. The clock is mounted in place as illustrated, the bell removed and the alarm set as usual. When the alarm goes off the winding of the string around the winder lifts a piece of celluloid allowing the metal points to form contact. Obviously the regular switch must be left turned on so the clock can do its stuff.



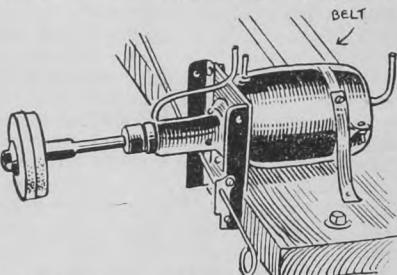
Getting Most Out Of Batteries

Where a multiple dry battery is used for starting or for ignition in an internal combustion engine during cold weather, the battery should be brought into the house at night so that it may be at room temperature when put into use in the morning. Flashlight batteries, in cold weather, will give much better service if kept at ordinary room temperature when not in use. Cold does not permanently injure a dry battery, but it does interfere with its functioning.

Generator Makes Grinder

This simple grinding wheel mounting is an old car generator with an extended, threaded shaft, strap iron brace strips and the belt running on the commutator. Copper tubes, bent to shape and soldered in place, carry oil to the bearings.

For a price usually less than a dollar, you can get a burned out generator with



good bearings which, after months of service, will be tighter and smoother running than the bearings in a grinding wheel stand with plain bearings, but built especially for the purpose and costing a great deal more.—Dale Van Horn.

Timing the Engine

One of the common causes of poor engine performance and decreased engine efficiency is incorrect timing of the ignition. I have personally known of many cases where the efficiency of the engine has been increased as much as 40 per cent by correct timing. This is true of small engines, automobiles and tractors. Ignition usually occurs at dead centre for starting and in advance to fire before dead centre for running. Timing will usually be correct on new engines and it is only when the unit has been removed, repaired or replaced or where wear has taken place that the ignition timing will be incorrect.

On practically every engine ignition marks will be found to aid the operator in checking timing. The marks are found in a variety of places and if the operator is not acquainted with the procedure it would be best to read that part of the instruction book that deals with timing. On some machines the timing can be advanced or retarded while the engine is operating on a steady load.

In order that the operator may get the extra miles to the gallon it is necessary to have the breaker point gap and the spark plug gaps correctly spaced as well as seeing that all wiring is in good condition.—O. H. Lovelace, Saskatoon, Sask.



1944 . . . Year of Destiny

THE SIGNALS of 1944 are the herald of tremendous events on land, sea, and in the air. The armed forces of the United Nations are poised to strike decisive blows for the Good Cause under the experienced and proven guidance of leaders who have earned and will receive the trust and confidence of the fighting men, who know that their lives will not be needlessly sacrificed but that every precaution of preparation will have been taken to ensure Victory at the lowest possible cost in human lives.

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. . . our farmers are girded and ready to begin what may well prove to be Farm Production's most significantly important contribution to the world made in the entire history of agriculture, the most ancient vocation of Man. . . . FOOD in all its varying forms will be a principal requirement of both the battle line and the civilian battle front.

This great and important munition of Victory — FOOD — will continuously be needed to equip and sustain our gallant sailors, soldiers and airmen for their decisive hour when Right and Might will clash to settle the destiny of the men, women and children of this generation and of generations to come.

The contribution of Farm and Field to the winning of final Victory can hardly be over-estimated. The influence and work of the western

farmer will this year be felt in the armed camps, on ships at sea, on landing barges, gun turrets, air armadas and in the infantry lines. Soon, also, please God, it will be felt in the lands of Europe, once free, but now enslaved by Nazi tyranny and might. Perhaps nowhere will supplies of food from Canada's farms be so regarded as heaven-sent blessing (which it is).

In these thoughts there will be inspiration and a satisfying sense of accomplishment felt in many a farmer's heart as he bends to his task and directs the operations of his farm; for it is literally true that the Canadian Farmer by his contribution of food is helping to make Victory doubly sure; just as his contribution must continue to play a primary part in post-war rehabilitation, both from the standpoint of human need and the free interchange of commodities upon which the restoration of world trade will depend. FOOD is in the world picture — to stay.

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